942/4

Vol. 942 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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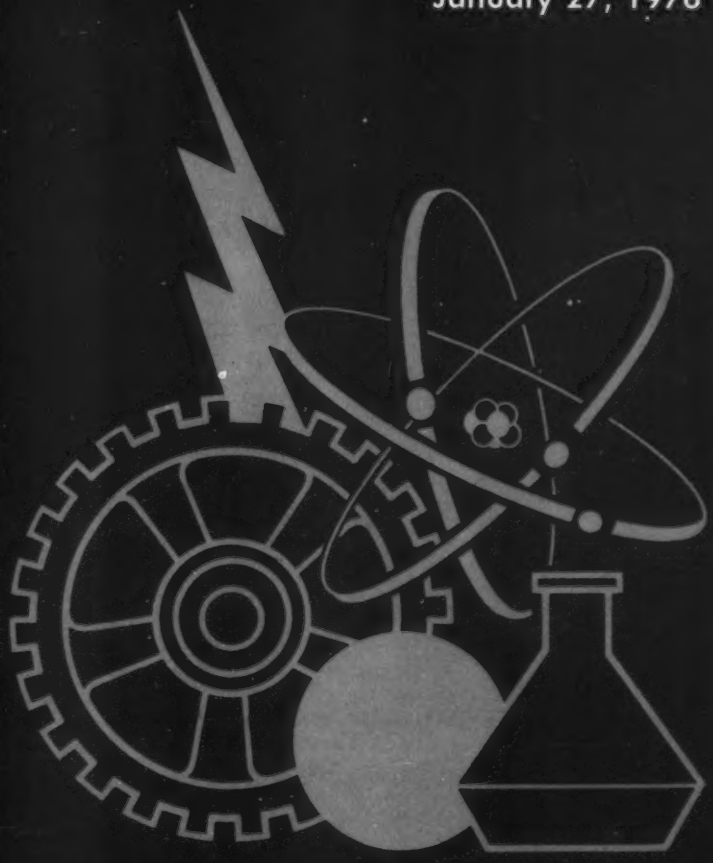

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 27, 1976 Volume 942 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Filing of Non-English Language Applications

This notice is in response to inquiries regarding the filing of applications in a language other than English. The Office has received a few such applications in the past in emergency situations where the filing of a non-English language specification was the only possibility of saving a foreign priority date or preventing the running of a statutory bar. In such situations the Office practice has been to accord the application a filing date if it includes all of the component parts required by 35 U.S.C. 111, and to require applicant to submit a verified translation of the previously filed application within two months.

In view of the inquiries received, it is considered appropriate that the Office clarify and publicize its practice in this area to avoid misunderstandings.

Accordingly, beginning February 1, 1976, the Office will accord a filing date to an application meeting the requirements of 35 U.S.C. 111 even though some or all of the application papers, including the written description and the claims, is in a language other than English and hence does not comply with 37 CFR 1.52, *provided:*

(1) the oath or declaration is signed and physically attached to the specification and claims to which it refers; and

(2) the application papers are accompanied by a statement, in English, from the applicant, his attorney or agent, certifying that is has been considered necessary to file the non-English language application in order to save a foreign priority date or prevent the running of a statutory bar.

A verified English translation of the non-English language papers should either accompany the application papers or be filed in the Office no later than two months after a notice requesting the translation has been mailed by the Office.

A subsequently filed verified English translation must contain the complete identifying data for the application in order to permit prompt association with the papers initially filed. Accordingly, it is strongly recommended that the original application papers be accompanied by a cover letter and a self-addressed return post card, each containing the following identifying data in English: (*a*) applicant's name(*s*); (*b*) title of invention; (*c*) number of pages of specifications, claims, and sheets of drawings; (*d*) whether oath or declaration was filed and (*e*) amount and manner of paying the filing fee.

The translation must be a literal translation verified as such by the translator, and must be accompanied by a signed request from the applicant, his attorney or agent, asking that the verified English translation be used as the copy for examination purposes in the Office. If the verified English translation does not conform to idiomatic English and United States practice it should be accompanied by a preliminary amendment making the necessary changes without the introduction of new matter prohibited by 35 U.S.C. 132. In the event the verified literal translation is not timely filed in the Office the application will be regarded as abandoned.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be routinely used for filing applications. There are at least two reasons why this should not be used on a routine basis. First, there are obvious dangers to applicant and the public if he fails to obtain a correct literal translation. Second, the filing of a large number of applications under the procedure will create significant administrative burdens on the Office.

The practice will be closely monitored to determine whether or not it should be continued.

C. MARSHALL DANN,
Dec. 31, 1975. *Commissioner of Patents and Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before March 1, 1976.

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Jan. 5, 1976. *Chairman, Committee on Enrollment.*

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Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,762,777, Went, Van Oosterhout and Gorter, PERMANENT MAGNET AND METHOD OF MAKING THE SAME; **2,762,778,** Gorter, Rathenau and Stuyils. METHOD OF MAKING MAGNETICALLY-ANISOTROPIC PERMANENT MAGNETS, **filed** Sept. 3, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 75–1131, *U.S. Philips Corporation* v. *Ferro Corporation.* Judgment of District Court affirmed, Sept. 3, 1975.

2,762,778. (See 2,762,777.)

2,795,022, N. Shaw, METHOD OF MAKING MOULDS; **2,811,760,** C. Shaw, METHOD FOR THE PRODUCTION OF CASTING MOULDS; **2,911,310,** N. Shaw, INVESTMENT MATERIALS FOR CASTING MOULDS; **2,931,081,** A. Dunlop, MOULD STRUCTURE AND ITS PRODUCTION; **2,935,772,** C. Shaw, PREVENTION OF SCALE FORMATION ON CASTINGS; **2,979,790,** I. J. Lubalin, MOLDS; **3,022,555,** N. Shaw, same, **filed** Sept. 2, 1975, D.C., S.D.N.Y., Doc. 75–C–4317, *Avnet Shaw* v. *Manco Products, Inc.*

2,811,760. (See 2,795,022.)

2,911,310. (See 2,795,022.)

2,931,081. (See 2,795,022.)

2,935,772. (See 2,795,022.)

2,959,298, E. Pope, SANITARY TRAY RACK, **filed** Sept. 8, 1975, D.C., W.D. Tenn. (Jackson), Doc. 75–72–E, *Standex International Corporation* v. *Kolpak Industries, Inc. and Blair E. Stentz.*

2,979,790. (See 2,795,022.)

3,022,555. (See 2,795,022.)

3,228,423, W. C. Moog, FLUID CONTROL VALVE IN WHICH A MECHANICAL MOTION IS TRANSMITTED FROM A DRY REGION TO A PRESSURIZED FLUID FILLED REGION, **filed** Sept. 5, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 74–2190, *Moog, Inc.* v. *Pegasus Laboratories, Inc.* The judgment of the District Court is affirmed, Sept. 5, 1975.

3,271,858, J. J. Simmons, REMOVABLE DENTAL APPLIANCES AND METHODS OF MAKING SAME; **3,486,230,** same, DENTAL APPLIANCE, **filed** Aug. 28, 1975, D.C., N.D. Iowa (Cedar Rapids), Doc. C–75–48, *Iowa Development Company* v. *Dental Prosthetic Services, Inc. and Paul L. Jones, Jr.*

3,358,577, Q. R. Thomson, AIR DIFFUSING REGISTER, **filed** Sept. 17, 1975, D.C., N.D. Tex. (Dallas), Doc. CA–3–75–1146 G, *Lear-Seigler, Inc., Krueger Division* v. *David Pulley and Associates, Inc. and David Pulley, an individual.*

3,437,149, Cugini and Jeannerett, CABLE FEED-THROUGH MEANS AND METHOD FOR WELL HEAD CONSTRUCTIONS, **filed** Sept. 12, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–3103–IH, *Seaboard Pipe & Equipment Company, Inc.* v. *Alex Sipowicz, doing business as Sipp Machine & Tool Co. and Sipp Tool Corporation.*

3,486,230. (See 3,271,585.)

3,570,733, B. W. Allen, POWER-ACTUATED PLATE GLASS CUTTER'S TABLE; **3,787,040,** B. W. Allen, TILTABLE GLASS CUTTER'S TABLE WITH RETRACTABLE SHEET SUPPORTING PEGS, **filed** Sept. 16, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–1140, *Ernest Evans Roberts, Jr.* v. *Rod Spence and Rod Spence and Company.*

3,725,266, J. M. Haviland, PROCESS FOR REMOVING METAL COMPOUND CONTAMINANTS FROM WASTE WATER, **filed** Sept. 16, 1975, D.C., C.D. Pa. (Philadelphia), Doc. 75–2625, *Haviland Products Company* v. *A. M. Lavin Machine Works, Inc. and Wm. F. Lotz, Inc.*

3,783,772, R. J. Fay, SANDWICH MACHINE, **filed** Sept. 17, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–390–WS, *J. W. Fay & Son, Inc.* v. *Royal Cake Company, Inc.*

3,787,404. (See 3,570,733.)

3,799,762, B. E. Cass, SLAG CONDITIONERS FOR IRON AND STEEL PROCESSES, **filed** Sept. 10, 1975, D.C., W.D. Pa. (Pittsburgh), Doc. 75–1147, *National Briquette Corp. and A. C. Miller Corporation* v. *Carad Inc.*

3,862,506, Drenten and Breiner, LABEL HOLDER, **filed** Sept. 16, 1975, D.C., S.D.N.Y., Doc. 75–C–4533, *Supreme Equipment & Systems Corp.* v. *Steel Case, Inc.*

D. 220,644, L. D. Robinson, MONEY BOX, **filed** Aug. 7, 1975, D.C., E.D. Calif. (Fresno), Doc. F–75–144–C, *L. Elsworth Robinson and Leva Delores Robinson, individually and doing business as Cash Caddy Corporation* v. *Interstate Restaurant Supply Company, Inc.* **Same, filed** Aug. 8, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–2691–F, *L. Elsworth Robinson* v. *"Hoosier-Wolf."*

PATENT NOTICES

Certificates of Correction for the Week of Jan. 27, 1976

D. 235,988	3,890,910	3,901,481	3,908,612
D. 236,431	3,891,472	3,901,564	3,909,981
3,513,004	3,891,661	3,901,568	3,910,114
3,729,593	3,891,787	3,901,650	3,910,201
3,742,042	3,892,187	3,901,730	3,910,301
3,816,376	3,892,647	3,901,804	3,910,876
3,819,892	3,893,137	3,902,592	3,911,114
3,833,559	3,893,422	3,903,118	3,911,173
3,840,018	3,893,498	3,903,509	3,911,250
3,843,529	3,893,906	3,904,631	3,911,405
3,848,633	3,894,987	3,905,035	3,911,443
3,849,196	3,895,017	3,905,398	3,911,587
3,849,218	3,895,719	3,905,574	3,912,199
3,850,345	3,896,092	3,905,926	3,912,389
3,852,077	3,896,572	3,906,327	3,912,511
3,853,574	3,897,199	3,906,340	3,912,522
3,853,876	3,897,385	3,906,850	3,912,738
3,854,919	3,897,636	3,906,851	3,912,845
3,854,971	3,898,267	3,907,019	3,912,942
3,858,291	3,898,268	3,907,046	3,913,150
3,858,752	3,898,378	3,907,518	3,913,340
3,859,419	3,898,553	3,907,663	3,913,829
3,859,539	3,899,431	3,907,812	3,913,991
3,873,382	3,899,544	3,907,912	3,914,018
3,876,582	3,899,779	3,907,924	3,914,061
3,876,680	3,899,805	3,907,934	3,914,125
3,880,540	3,900,219	3,907,966	3,914,596
3,881,454	3,900,520	3,908,087	3,914,744
3,889,424	3,900,635	3,908,126	3,915,299
3,890,401	3,900,823	3,908,207	3,917,876
3,890,596	3,900,895	3,908,384	

Department of the Treasury
U.S. Customs Service

(TMK–2–R : E : R)

Notice of Application for Recordation of Trade Name

EUROTIME

Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for recordation under section 12 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name EUROTIME used by Eurotime Corporation, a corporation organized under the laws of the State of New York, located at 212 Fifth Avenue, New York, New York 10010.

The application states that the trade name is applied to watches and clocks and components for each, manufactured in Switzerland, West Germany, France and Hong Kong. The application states further that no foreign person, partnership, association or corporation is authorized to use the trade name sought to be recorded. Appropriate accompanying papers were submitted with the application.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Any such submission should be addressed to the Commissioner of Customs, Washington, D.C. 20229, in time to be received not later than 30 days from the date of publication of this notice in the Federal Register.

Notice of the action taken on the application for recordation of the trade name will be published in the Federal Register.

LEONARD LEHMAN,
Assistant Commissioner, Regulations and Rulings.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 3, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-10-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-3-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-13-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-1-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-7-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-10-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-23-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-15-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-19-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-4-75

Expiration of patents: The patents within the range of numbers indicated below expire during January 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,866,973 to 2,871,478 inclusive
Plant Patents..... Numbers 1,792 to 1,804 inclusive

PATENT APPLICATIONS

PUBLISHED JANUARY 27, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before April 27, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 163,463

APPARATUS FOR DRYING CARBON BLACK PELLETS

Claude V. Myers, El Dorado, Ark., assignor to Cities Service Company, Tulsa, Okla.

Division of Ser. No. 47,085, June 17, 1970, Pat. No. 3,740,861. This application July 16, 1971, Ser. No. 163,463

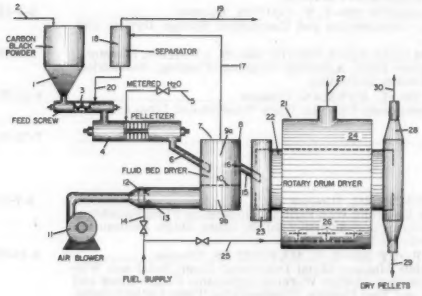
Int. Cl.[2] C09C *1/58*

U.S. Cl. 425—222 **5 Claims**

References Cited

UNITED STATES PATENTS

245,980	8/1881	Smith	34/133
2,117,822	5/1938	Pehrson et al.	34/10
3,238,634	3/1966	Goins	34/10
3,282,577	11/1966	Cottle	34/57 R X
3,309,780	3/1967	Goins	34/57 R
3,469,323	9/1969	Jongbloed et al.	34/57 R X
3,513,560	5/1970	Lamare	34/10



1. Apparatus for producing dry pellets of carbon black comprising:

a. carbon black wet pelletizer,

b. a fluid bed dryer adapted to receive pellets which are discharged from said pelletizer, a conduit connecting said pelletizer and said dryer for directing said pellets from the pelletizer to the fluid bed dryer

c. a rotary drum dryer adapted to receive pellets which are discharged from said pelletizer and a conduit connecting said fluid bed dryer and said rotary drum dryer for directing said pellets from the fluid bed dryer to the rotary drum dryer.

B 416,589

METHOD AND DEVICE FOR PRINTING A WEB OR A RECTANGULAR PIECE OF MATERIAL

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Amsterdam N.V., Amstelveen, Netherlands

Continuation-in-part of Ser. No. 173,970, Aug. 23, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,589

Claims priority, application Netherlands, Oct. 7, 1970, 7014707

Int. Cl.[2] B41F *15/10*, *15/42*

U.S. Cl. 101—129 **2 Claims**

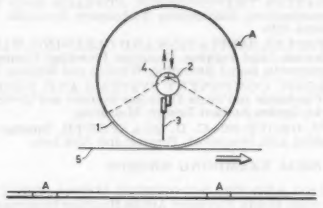
References Cited

UNITED STATES PATENTS

2,893,310	7/1959	Johnson	101/182
3,541,953	11/1970	Rochford	101/219 X
3,718,086	2/1973	Vertegaal	101/120 X
3,774,533	11/1973	Ichinose	101/119
3,774,534	11/1973	Ichinose	101/119
3,834,307	9/1974	Zimmer	101/119 X

FOREIGN PATENTS OR APPLICATIONS

2,054,570	5/1971	Germany	101/116



1. In the process of printing a design on material using a rotary thin-walled cylindrical screen stencil having a squeegee therein wherein the design to be printed has a repeat length greater than the circumference of the stencil, the steps of forming on the screen surface of the stencil an impermeable area extending along a portion of the circumference of the stencil and the remaining portion of the stencil defining a screened area, conveying the material to be printed past the stencil, and vertically moving the squeegee during rotation of the stencil during the time interval that the impermeable area is contiguous with the material to be printed so that fading out and fading in of color during lifting and lowering of the squeegee is prevented, the stencil selectively does not print the material when the squeegee is out of contact with the screen surface and when the impermeable area is contiguous with the material and the stencil prints only when its squeegee is lowered and the screened area passes in contact with the material whereby a design having a repeat length greater than the circumference of the stencil can be printed.

B 429,157

PLASTIC BAG WITH ZIG ZAG PLIES

van den Beld, Paul Christiaan Herman; Robert Jan Hoogenboom, both of Hardenberg, and Willem Zweers, Coevorden, all of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Filed Dec. 28, 1973, Ser. No. 429,157

Claims priority, application Netherlands, Jan. 6, 1973, 7300211

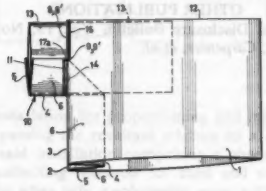
Int. Cl.² B65D *31/14*

U.S. Cl. 229—62.5 10 Claims

References Cited

UNITED STATES PATENTS

1,819,425	8/1931	Kronmiller	229/62.5
2,340,546	2/1944	Meaker	229/62.5 X
2,959,343	11/1960	Rosander	229/62.5
3,004,698	10/1961	Ashton	229/62.5
3,167,241	1/1965	Woerner	229/62.5



1. A plastic bag obtained from a tubular foil and having in the flattened condition longitudinal edges, there being an inward fold (4) along one longitudinal edge to define first and second longitudinal plies (5,6) having ply longitudinal edges (2,3), a transverse sealed joint (12) on said tubular foil to define an end of the bag, there being first and second longitudinal incisions (8,8') in said plies (5,6) said incisions extending from said bag end and terminating at respective incision end points (9,9') on said longitudinal ply edges (2,3) to define a foil flap (10), said foil flap (10) being folded outwardly and a tubular filling valve (13) inserted in the opening defined by said outwardly folded foil flap, a first sealed joint (14) extending from said end points in a direction away from said bag end transverse sealed joint to connect said foil flap with said tubular filling valve, and a second sealed joint (15) from said end points extending to said end transverse joint connecting said tubular filling valve to the edges of said foil adjacent said incisions to close the tubular foil.

B 433,094

VEHICLE AUXILIARY HYDROSTATIC DRIVE SYSTEM

Billie Gene Hunck, and James Henry Kress, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 14, 1974, Ser. No. 433,094

Int. Cl.² B60K *17/30*

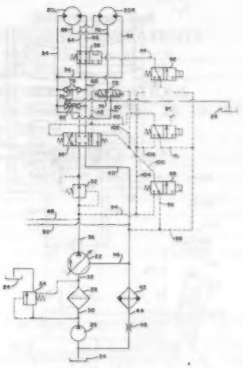
U.S. Cl. 180—49 4 Claims

References Cited

UNITED STATES PATENTS

3,129,781	4/1964	Stein	180/44 F
3,458,005	7/1969	Malm et al.	180/60
3,473,442	10/1969	Farmer et al.	60/494
3,506,081	4/1970	Rumsey	180/44 F
3,511,131	5/1970	Kress	91/176
3,640,066	2/1972	Marshall	60/466
3,641,765	2/1972	Hancock	180/44 F
3,672,167	6/1972	Griesenbrock	180/66 R
3,811,525	5/1974	Stuart	180/66 R

1. A vehicle having an engine, a pair of main drive wheels, variable ratio transmission means for transmitting driving torque from the engine to the main drive wheels, a pair of steerable wheels, and an auxiliary hydrostatic drive system for the steerable wheels including a fluid pump, a reservoir providing a supply of fluid for the pump, at least one reversible reciprocating piston type motor drivingly connected to the steerable wheels, said motor having first and second ports and a drive chamber port, first fluid line means interconnecting the pump and reservoir with the first and second ports in the motor, and motor control valve means interposed in the first fluid line means movable to either side of a neutral, fluid blocking position to deliver fluid from the pump to either the first or second ports in the motor, characterized in that a second valve has first and second sides, second fluid line means connects the drive chamber port with the first side of the second valve, additional fluid line means interconnects the reservoir, the second side of the three-way valve and the first



fluid line means between the motor and motor control valve means, first check valve means are interposed in the additional fluid line means to prevent flow of fluid from the first fluid line means to the additional fluid line means, further fluid line means separate from the additional fluid line means interconnects the first fluid line means between the motor and motor control valve means with the second side of the three-way valve, second check valve means are interposed in the further fluid line means to prevent flow of fluid from the further fluid line means to the first fluid line means, and the three-way valve is movable between a first neutral position in which it interconnects the further fluid line means with the second fluid line means to destroke the motor and at least one additional position in which it interconnects the additional fluid line means with the second fluid line means to vent the drive chamber port to the reservoir.

B 465,145

COMBINED FLUID MOTOR AND PUMPING APPARATUS

Walter L. McLuckie, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 29, 1974, Ser. No. 465,145
Int. Cl.² F15B 7/10
U.S. Cl. 60—592 7 Claims

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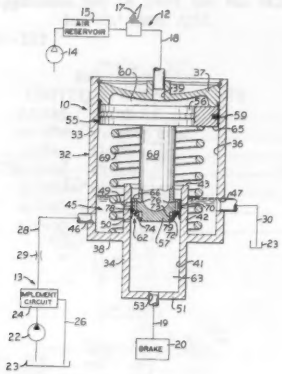
136,091	6/1875	Overend	417/498
2,517,952	8/1950	Welling	417/498
2,990,687	7/1961	McCrea	60/547
3,199,298	9/1965	Brown	60/552
3,407,601	10/1968	Beck	60/547 X
3,550,379	12/1970	Cox, Jr.	60/547
3,635,014	1/1972	Kress	60/543
3,768,608	10/1973	Fulmer	60/547 X



1. A combined fluid motor and pumping apparatus for pressurizing a closed hydraulic circuit work system upon selective actuation of such apparatus by a source of pressurized air, comprising;

piston means having a pair of axially spaced motor and pump piston ends;

an upright housing providing a predetermined upper motor portion having said motor piston end of said piston means slidably mounted therein and a lower pumping portion having said pump piston end slidably mounted therein, said motor portion being provided with a lower end and said pumping portion being provided with a predetermined upper segment extended into said motor portion and having an open upper end disposed a predetermined distance above said lower end of the motor portion, said upper segment having a size diametrically smaller than said motor portion to define an annular chamber disposed in surrounding relation to said upper segment of the pumping portion for providing an oil makeup reservoir;

means for selectively communicating said reservoir with said pumping portion; and

means for automatically replenishing any oil consumed from said reservoir so that the reservoir is continuously maintained with a sufficient amount of oil for recharging said work system as required.

B 481,600

AUTOMATIC PRINT GAP ADJUSTMENT ARRANGEMENT

Roy D. Thomas, Wenonah, N.J., and Ross W. Johnston, Norristown, Pa., assignors to Sperry Rand Corporation, Blue Bell, Pa.

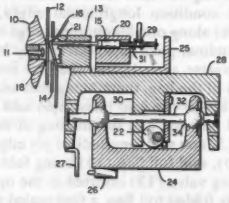
Division of Ser. No. 401,524, Sept. 27, 1973, abandoned. This application June 21, 1974, Ser. No. 481,600
Int. Cl.³ B41J 1/20
U.S. Cl. 101—93.14 7 Claims

References Cited
UNITED STATES PATENTS

2,831,424	4/1958	MacDonald	101/111 X
3,408,930	11/1968	Chamness et al.	101/111 X
3,623,427	11/1971	Buehrmann et al.	101/111 X
3,730,082	5/1973	Perry	101/93 C
3,742,848	7/1973	Huntoon et al.	101/93 C
3,750,792	8/1973	Liles	197/1 R
3,793,951	2/1974	Denley	101/111
3,828,669	8/1974	Bonafino et al.	101/111

OTHER PUBLICATIONS

IBM Technical Disclosure Bulletin, Vol. 13, No. 12, May 1971, p. 3643, *Carpenter, et al.*



1. A printer device of the type wherein a print hammer is separated from a print band and the print hammer is directed toward the print band comprising,

a. a print head means including the print hammer;

b. a print form wherein both the print head means and form are located on a fixed carriage, said print form having a variable thickness depending upon whether it is a single or multi-part form;

c. a movable print type band;

d. a ribbon wherein both said band and ribbon are located on a movable carriage, said ribbon having a thickness which is variable upon replacement;

e. means located in proximity to said movable carriage for simulating the print hammer striking said ribbon and form;

f. means responsive to said simulation of the print hammer for positioning said print band the required distance from said print hammer.

B 487,260

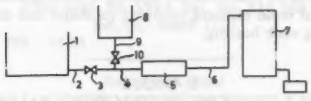
INSTALLATION FOR FEEDING A CURD/WHEY MIXTURE IN THE CORRECT RATIO TO A CHEESE STUFFING MACHINE

Geert de Boer, Lippenhuizen, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

Filed July 10, 1974, Ser. No. 487,260
Claims priority, application Italy, July 18, 1973, 10020/73
Int. Cl.² B67D 5/52
U.S. Cl. 222—136 1 Claim

References Cited
UNITED STATES PATENTS

1,327,990	1/1920	French	222/136
2,065,128	12/1936	Eisinger	222/136 X
2,758,566	8/1956	Talbott	222/136 X



1. An installation for proportioning and mixing whey and curd and passing the resultant mixture to a cheese stuffing machine, said installation comprising a cheese stuffing machine, a collecting reservoir for curd and whey, a second reservoir for whey only, a volumetric pump with a suction pipe and a pressure pipe, said collecting reservoir being connected to the pump suction pipe, and a conduit connecting said second reservoir for whey to the suction pipe of said pump, and a valve in said conduit for controlling the flow of whey therethrough, the pressure pipe of said pump being connected to said cheese stuffing machine for the passage of the mixture of whey and curd thereto.

B 490,067

MICROFICHE FILM PACK

James Michael Marsh, Yorba Linda, and William R. Swift, Placentia, both of Calif., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

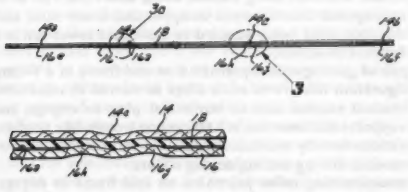
Filed July 19, 1974, Ser. No. 490,067
Int. Cl.² B65D 85/00; G03B 17/26, 41/18
U.S. Cl. 206—455 4 Claims

References Cited
UNITED STATES PATENTS

1,536,341	5/1925	Hodgson	250/478
2,663,418	12/1953	Grunwald	206/455
3,338,400	8/1967	Edgworth et al.	206/484 X

FOREIGN PATENTS OR APPLICATIONS

1,076,834	3/1960	Germany	250/475
231,487	11/1925	United Kingdom	206/455



1. A microfiche film pack comprising in combination:

a pair of oppositely disposed opaque covers one of which is formed with an offset portion providing a three-sided pocket;

a sheet of photosensitive material between said covers and partially enclosed within said pocket;

means sealing together said covers along the sides of said pocket; and

a light trap formed by means of parallel cooperating indentations in said covers and said sheet extending the width of said oppositely disposed covers adjacent that portion of said photosensitive material not enclosed within said pocket.

B 496,999

PRINTING DEVICE OPERATING WITH A CYCLOIDAL PRINTING MOTION FOR DATA PROCESSING MACHINES

Joachim Thienemann, Hamburg, Germany, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Aug. 13, 1974, Ser. No. 496,999
Claims priority, application Germany, Aug. 16, 1973, 2341347
Int. Cl.² B41J 1/20, 7/36
U.S. Cl. 101—93.13 3 Claims

References Cited
UNITED STATES PATENTS

823,080	6/1906	Richards	197/18
3,144,820	8/1964	Wales, Jr.	197/18 X

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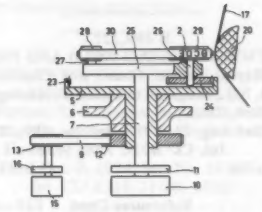
Western Electric Technical Digest, No. 28, 10–1972, Endless Carrier Printers, p. 23.



1. A printing device operating with a cycloidal printing motion and having a revolving type carrier, the types of which are guided over cycloidal paths by a planetary gear drive having two degrees of freedom, a selected character being printed at the stationary points of the cycloidal path, comprising a sun gear mounted for rotation about a first axis, a connection member fixed to said first axis, a second axis rotatably carried at one end of said connection member, a planet gear mounted for rotation about said second axis in engagement with said sun gear, a pressure roller coupled to said planet gear and mounted for rotation about said second axis, a third axis carried by said connection member spaced from said first end, a guide roller mounted to said connection member for rotation about said third axis, and an elastic band carrying type arranged about said pressure and guide rollers.

B 499,171

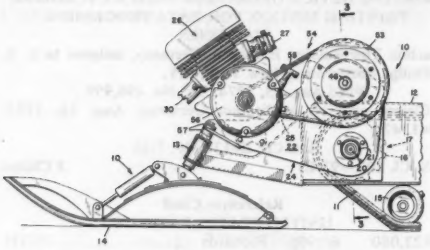
ENGINE AND DRIVE TRAIN SUSPENSION SYSTEM FOR SNOWMOBILES

Donald G. Samuelson, Anoka, and Charles A. Baxter, Minneapolis, both of Minn., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 21, 1974, Ser. No. 499,171
Int. Cl.² B62M 27/02
U.S. Cl. 180—5 R **15 Claims**

References Cited
UNITED STATES PATENTS

1,068,883	7/1913	Frank	180/5 R
3,756,334	9/1973	Williams	180/5 R
3,794,131	2/1974	Freedman	180/5 R
3,822,755	7/1974	Hine	180/5 R



1. In a snowmobile including a rearward track and forward ski members:
   - a housing enclosing said tr... ,
   - a track drive member passing through said housing;
   - a source of mechanical energy of rotation coupled to said drive member external to said housing;
   - and cradle means including a pair of spaced rigid plate members resiliently mounting said source and said drive member on said housing.

B 499,227

INVESTMENT CASTING MOLD AND PROCESS

Douglas R. Hayes, Vernon, Conn., and Charles M. Phipps, Ridgewood, N.J., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 21, 1974, Ser. No. 499,227
Int. Cl.² B22C 7/02, 9/22
U.S. Cl. 164—26 **15 Claims**

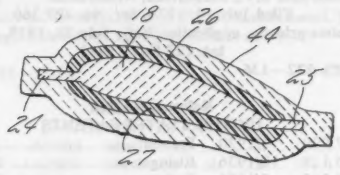
References Cited
UNITED STATES PATENTS

2,782,476	2/1957	Brennan	164/338
2,912,729	11/1959	Webb	106/38.9 X
3,627,015	12/1971	Giamei	164/23 X
3,669,177	6/1972	Ingalls et al.	164/34 X

FOREIGN PATENTS OR APPLICATIONS

678,035	8/1952	United Kingdom	164/34

1. In the manufacture of a mold for use in precision casting of mating thin walled parts from high temperature alloys, the steps of
   - providing a precast, high strength central mold element of adequate strength to avoid deformation during heating and casting of the said mold element having article forming surfaces on opposite surfaces thereof and edge flanges extending beyond the article forming surfaces and the wax patterns,
   - positioning individual wax patterns on opposite sides of the element, one on each article forming surface of the element,
   - forming a shell mold around the assembled mold element including the edge flanges and the patterns on the element by successively dipping the element with the patterns thereon in a ceramic slurry, stuccoing with refractory particles to form a coating and drying the coating to form the desired shell thickness, and



   - heating the shell mold to harden it and to melt out the wax patterns in readiness for making a casting therein, the central mold element retaining its shape and dimension during such heating.

B 499,352

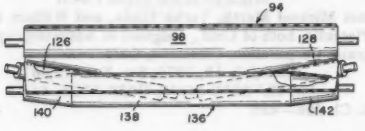
BELT TRACKING SYSTEM FOR A BALER

Carmen S. Phillips, and Charles D. Mecklin, both of Memphis, Tenn., assignors to International Harvester Co., Chicago, Ill.

Filed Aug. 21, 1974, Ser. No. 499,352
Int. Cl.² B65G 15/62
U.S. Cl. 198—202 **9 Claims**

References Cited
UNITED STATES PATENTS

2,480,294	8/1949	Hume	198/208
2,568,174	9/1951	Staacke	198/202
2,966,065	12/1960	Renner	198/202
3,132,785	5/1964	Kunz	198/202
3,240,321	3/1966	Lo Presti et al.	198/202
3,710,927	1/1973	Alsted	198/202
3,722,197	3/1973	Vermeer	56/341



1. In a baler having an endless drivable belt upon which an incoming stream of hay is adapted to be rolled into a cylindrical bale, a support and tracking system for the belt comprising:
   - a generally horizontal frame extending fore-and-aft of the baler;
   - a power-drivable roller journaled on a forward portion of said frame;
   - a tightener roller journaled on a rearward portion of said frame, said belt being trained about said rollers so as to be disposed therebetween in upper and lower runs, said drivable roller being adapted to move said lower run in a forward direction;
   - a pair of guiding rollers journaled on said frame in a V-configuration relative to each other as viewed in transverse vertical section and in horizontal plan to engage and support said lower run in a transverse trough-like configuration, thereby maintaining said belt in centered relation on said driving and tightening rollers;
   - a compensating roller journaled on said frame in engagement with said lower run between said guiding rollers and said drivable roller, said compensating roller having a cylindrical central portion and outwardly tapered end

portions for engaging the troughed lower run as received from said guiding rollers to dispose the lower run uniformly into contact with said drivable roller.

B 510,588

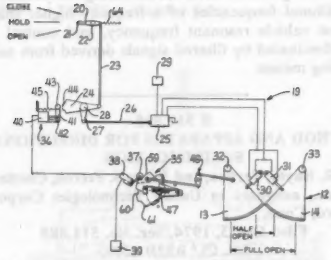
WAGON DOOR CONTROL SYSTEM AND DUAL CAM THEREFOR

Bernard E. Proeschl; Ralph C. Schell, both of Decatur, and James M. Stanley, Oreana, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 30, 1974, Ser. No. 510,588
Int. Cl.² B60P *1/56*
U.S. Cl. 298—35 M **12 Claims**

References Cited
UNITED STATES PATENTS

2,927,541	3/1960	Lunde	298/35 M X
3,289,546	12/1966	Erickson	91/358 A
3,427,075	2/1969	Kress et al.	298/35 M



1. In a wagon having a movable dump door means, the improvement comprising: control means selectively manually positionable in an Open position and a Close position; power means responsive to the positioning of the control means in the Open position to move the door means to an open position and to the positioning of the control means in the Close position to move the door means to a closed position; powered means for throwing the control means to a Hold position from either of said Open and Close positions; and cam means responsive to the movement of the door means by said power means to either of said open and closed positions to operate said powered means to throw said control means to said Hold position thereby stopping further movement of the door means in the selected door position, said cam means including means for selectively arranging a camming portion thereof to operate said powered means to throw said control means to said Hold position selectively when said door reaches a preselected partially open position intermediate said closed and open positions.

B 510,855

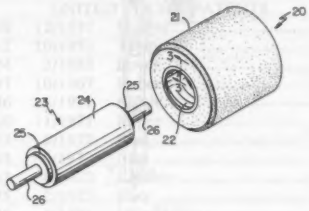
TEXTILE COT

Walter L. Dodson, 122 Old Clyde Road, Canton, N.C. 28716

Filed Sept. 30, 1974, Ser. No. 510,855
Int. Cl.² B21B *31/08*
U.S. Cl. 29—127 **15 Claims**

References Cited
UNITED STATES PATENTS

954,055	4/1910	Smith	29/127 X
1,092,775	4/1914	Kempshall	29/132
2,046,136	6/1936	St. Claire	29/127
2,046,137	6/1936	Prentis	29/127
2,597,858	5/1952	Freedlander	29/130
2,960,749	11/1960	Robertson et al.	29/127 X
3,173,172	3/1963	Pasquetti	29/200 B
3,229,352	1/1966	Balkin et al.	29/132
3,308,523	3/1967	Ivester et al.	29/127
3,593,398	7/1971	Hess et al.	29/132



1. A textile cot comprising an elastomeric outer portion and a rigid core bonded to and supporting said outer portion, said core comprised of a continuous interlocking tube capable of being expanded radially a sufficient amount to provide a press fit against an associated cylindrical supporting structure, said tube formed of elongated helically wound strip means having mechanically interlocking projections.

B 511,156

WELL TUBING PARAFFIN CUTTING APPARATUS AND METHOD OF OPERATION

Darrell G. Warner, New Orleans, and William D. Loth, Covington, both of La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 2, 1974, Ser. No. 511,156
Int. Cl.² E21B *21/00*, *37/02*
U.S. Cl. 166—311 **16 Claims**

References Cited
UNITED STATES PATENTS

2,117,836	5/1938	Brown	166/173
2,205,739	6/1940	Wilson	166/173
2,636,565	4/1953	Williams	166/170
2,720,925	10/1955	Lynch	166/176
2,825,411	3/1958	Keltner	166/173
2,981,331	4/1961	Arterbury	166/311
3,016,094	1/1962	Abbott	166/226
3,072,194	1/1963	Winders	166/170
3,376,936	4/1968	Tomlin	166/226
3,394,763	7/1968	Page	166/311
3,791,445	2/1974	True	166/224 A

1. A paraffin cutter for use in removing paraffin from a well tubing comprising a stationary wireline operated subsurface safety valve;

means for releasably connecting said paraffin cutter to said subsurface safety valve and

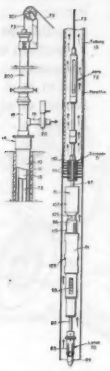
for permitting sufficient tension to be applied to said subsurface safety valve to maintain said subsurface safety valve

open while said paraffin cutter and said subsurface safety valve remain connected together.

11. A method for cutting paraffin from a tubing containing a wireline operated subsurface safety valve comprising the steps of:

lowering paraffin cutting apparatus containing cutting elements engageable with the wall of said tubing through said tubing on a wireline;

connecting said paraffin cutting apparatus to said safety valve;



applying sufficient tension to said wireline to open said safety valve and maintain said safety valve open;

manipulating said wireline to disconnect said paraffin cutting apparatus from said safety valve and to expose cutting elements on said paraffin cutting apparatus for engagement with the wall of said tubing; and

pulling said paraffin cutting apparatus upwardly through said tubing by said wireline with said cutting elements in engagement with the wall of said tubing.

B 511,346

ATTITUDE CONTROL SYSTEM

George L. von Pragenau, and Charles C. Rupp, Huntsville, both of Ala., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 2, 1974, Ser. No. 511,346
Int. Cl.² B64G *1/20*
U.S. Cl. 244—169 **1 Claim**

References Cited
UNITED STATES PATENTS

3,132,828	5/1964	Edinger et al.	244/3.2 X
3,301,508	1/1967	Yamron	244/3.2 X
3,395,874	8/1968	Bartoli et al.	244/32

FOREIGN PATENTS OR APPLICATIONS

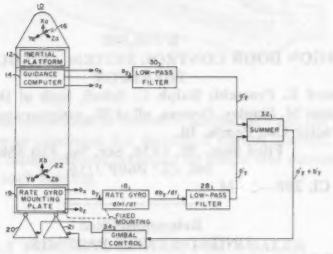
952,267	3/1964	United Kingdom	244/3.2

1. In an attitude control system for a space vehicle including at least one aft mounted and gimbaled motor, a motor gimbal control, the guidance means positioned in the forward region of said vehicle having an inertial reference platform and computing means for computing and providing attitude error signals in terms of a fixed inertial set of axes, the improvement comprising:

angular rate sensing means comprising at least one rate gyro fixedly mounted on said vehicle in the aft end region of said vehicle for providing at least one set of rate signals representative of the rate of rotation of said vehicle about at least one axis, said rate signals increasing in amplitude with increasing frequency and having a relatively low output at frequencies below the lowest resonance of said vehicle;

summing means responsive to attitude error signals from said guidance means and rate signals from said angular rate sensing means for summing said rate signals and said error signals;

low-pass filter means responsive to summed signals from said summing means for applying an integrating and



attenuating effect to said summed signals above the lowest resonant frequency of said vehicle and providing the control signals to said motor gimbal control; and

whereby for conditions of absence of vibrational frequencies higher than said lowest vehicle resonance, said control signals are dominated by attitude error filtered signals from said guidance means, and during the occurrence of vibrational frequencies of a freqency higher than said lowest vehicle resonant frequency, said control signals are dominated by filtered signals derived from said rate sensing means.

B 511,885

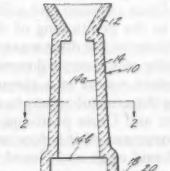
METHOD AND APPARATUS FOR DIRECTIONAL SOLIDIFICATION

Douglas R. Hayes, Vernon, and James S. Perron, Chester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 3, 1974, Ser. No. 511,885
Int. Cl.² B22D *25/06*
U.S. Cl. 164—60 **10 Claims**

References Cited
UNITED STATES PATENTS

3,514,069	5/1970	Daley	249/111
3,532,155	10/1970	Kane et al.	164/60
3,678,988	7/1972	Tien et al.	164/49



1. Apparatus for making columnar grained articles including,

a chill plate for controlling the cooling of the mold and alloy therein,

a ceramic mold including an article portion having a cavity and a base portion having a cavity communicating with the cavity in the article portion,

a spacer ring of preformed ceramic material separate from the mold and positioned on said chill plate and on which the mold is positioned with the base portion resting on the spacer,

said spacer ring and mold providing a continuous cavity from the chill plate through the spacer and into and including the article portion cavity,

means surrounding the mold for heating the mold to a temperature substantially as high as the melting point of the alloy to be cast, and

the material and thickness of said spacer ring such that said ring is particularly resistant to damage by the steep thermal gradients developed during heating of the mold resting on the ring and simultaneous chilling of the ring by the chill plate, and said spacer ring serving to space the mold from the chill plate to reduce the thermal gradients therein.

B 514,687

HYDRAULIC CONTROL VALVE

Robert B. Janvrin, Kalamazoo, Mich., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,687

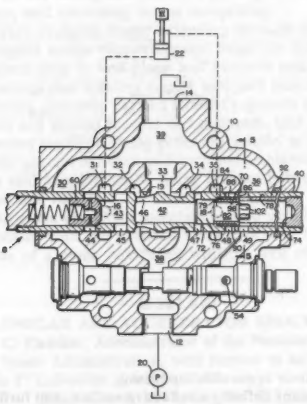
Int. Cl.² F15B *13/04*

U.S. Cl. 137—596.12 **14 Claims**

References Cited

UNITED STATES PATENTS

2,916,050	12/1959	Ruhl	137/625.68
2,949,097	8/1960	Vander Kaay	137/625.68



1. In a hydraulic control valve comprising a housing having inlet and exhaust ports and first and second motor ports, passageways interconnecting said ports, and a shiftable valve element having an internal flow passage, said valve element having four operative positions for controlling flow through said passageways, a first position in which said inlet and exhaust ports are interconnected and each motor port is isolated from the other of said ports, second and third positions in which said inlet port is isolated from said exhaust port and is connected with said first and second motor ports, respectively, while the exhaust port is connected with said second and first motor ports, respectively, and a fourth position in which said two motor ports are interconnected, and this interconnection is in restricted communication with said exhaust port, a check valve in said internal flow passage for preventing flow from said first motor port to said exhaust port when said valve element is moved between the first and second positions to said first position, the improvement comprising:

valve means associated with said shiftable valve element for preventing fluid communication between said second motor port and said exhaust port when said shiftable valve element is moved from between the first and third positions.

B 516,032

TORQUE LIMITER MECHANISM

Claude A. Smith, Sandusky, and Donald L. Williams, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 476,657, June 5, 1974. This application Oct. 18, 1974, Ser. No. 516,032

Int. Cl.² B65D *41/04*

U.S. Cl. 220—288 **1 Claim**

References Cited

UNITED STATES PATENTS

2,101,758	12/1937	Shaffer	220/200
2,613,012	10/1952	Taylor	220/296
3,023,924	3/1962	Boyer	220/288
3,343,697	10/1967	Roberts	215/220
3,589,486	6/1971	Kelch	192/46
3,616,960	11/1971	Miller	220/304
3,666,137	5/1972	Blau	220/288
3,667,642	6/1972	Blau	220/288
3,682,343	8/1972	Landen	215/9
3,715,075	2/1973	Blau	220/288
3,815,776	1/1971	Mac Millan	220/288
3,820,680	1/1975	Friend	220/203
3,831,801	1/1975	Rodgers	220/39

1. A torque release clutch mechanism comprising cover means having a top portion and a continuously formed circumferential flange thereon, a plurality of circumferentially spaced cam surfaces on the interior of said flange, each of said surfaces including a cam ramp and a cam notch having a land portion formed therebetween, a curved peak joining each of said ramps to an adjacent cam notch, a driven member having a head portion thereon with a peripheral flange received within said cover for rotation relative thereto, means for connecting said cover means and driven member against axial separation, a plurality of fingers formed integrally with said peripheral flange and of material tending toward a cold set distortion under prolonged stress, each finger having a root directed radially outwardly of said peripheral flange, each of said fingers including an arcuate segment joined to said root and having a tip biased radially outwardly of said peripheral flange and compressible radially inwardly toward said peripheral flange, each of said tips including a flat radially inwardly directed stop surface thereon engageable with said cam notches to interlock said cover with said driven member upon a first relative rotation therebetween, each of said tips further

including an inclined surface thereon, a sharp radius curve on said tip joining said stop surface and said inclined surface, said sharp radius curve being mateable with each of said cam ramps and movable thereacross to produce a limited resistance to relative rotation between said cover and said driven member upon rotation of said cover in a direction opposite to said first relative rotation and a torque release between said curved peaks and said sharp radius curves, to assure movement of said fingers radially outwardly to an unstressed park position on said land portion following movement of said fingers radially inwardly on said cam ramps, said inclined surface and said cam ramp having an angle of inclination whose tangent exceeds the coefficient of friction between said inclined surface and said cam ramp whereby said fingers will slip radially outwardly on said cam ramps if they are located thereon following cap tightening to assume an unstressed park position on said land portions following cap tightening, said flange having lugs formed integrally thereof at spaced circumferential points thereon to space said finger roots from said cover means, a plurality of ribs formed on said driven member engageable with said cover to space said finger tips axially of said cover means whereby said fingers are free to flex between said peripheral flange and said cam surfaces during movement thereof across said cam surfaces between torque released positions on said cam ramps and unstressed park positions on said land portions.

B 520,384

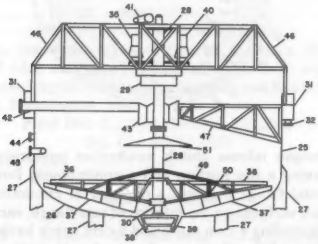
HOT WATER EXTRACTION CELL CONTAINING TWO OR MORE DEFLECTION BAFFLES

Robert A. Baillie, West Chester, Pa.; H. James Davitt, Edmonton, and David E. Rose, Calgary, both of Canada, assignors to Great Canadian Oil Sands Limited, Toronto, Canada

Filed Nov. 4, 1974, Ser. No. 520,384
Int. Cl.² B01D *11/02*; C10G *1/04*
U.S. Cl. 196—14.52 **1 Claim**

References Cited
UNITED STATES PATENTS

2,502,490	4/1950	Sweet	210/528 X
3,245,543	4/1966	Levendusky et al.	210/521
3,530,042	9/1970	Graybill et al.	196/14.52
3,847,789	11/1974	Cymbalisty	208/11



1. In a hot water process separation cell suitable for recovering bituminous froth from tar sands comprising;
   a. a tank;
   b. a rotatable center shaft running on the vertical axis of the tank from the top toward the bottom of the tank;
   c. a means for rotating said shaft;
   d. middlings outlets connected to the side and communicating with the interior of the tank for withdrawing middlings from the cell;
   e. a tar sands pulp inlet means to the tank, said means having an inlet at one end and communicating with the exterior of said cell and a discharge outlet located within said tank at the opposite end of said inlet means and having a feed well at its discharge end;
   f. a sand discharge outlet at the bottom of the tank for withdrawing sand tailings from the cell;
   g. an overflow means connected at the side of the tank and positioned adjacent to the tank to receive bituminous froth;
   h. a sand rake connected to said center shaft to rotate with the shaft and positioned to move settled sand toward said sand discharge outlet; the improvement which comprises
   i. and inverted saucer shaped baffle affixed immediately above said sand rakes and extending from and concentric with said shaft and having a skirt affixed to the outer periphery of said baffle and extending downward to a point between said baffle and the bottom of said tank; and
   ii. a second inverted saucer shaped baffle extending from said shaft and concentric therewith located immediately below the outlet of said feed well.

B 520,543

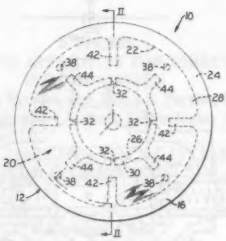
CENTER COOLED LASER MIRROR

Laurence R. Peters, Peoria, and William E. Streight, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 4, 1974, Ser. No. 520,543
Int. Cl.² G02B *5/08*
U.S. Cl. 350—310 **8 Claims**

References Cited
UNITED STATES PATENTS

3,488,110	1/1970	Evoy	350/310 X
3,817,606	6/1974	Locke et al.	350/310
3,861,787	1/1975	Locke et al.	350/310 X



1. A mirror apparatus comprising:
   body means defining a reflective surface, and further defining internal chamber means, the body means further defining a wall which substantially divides the chamber means into a first, inner chamber positioned generally centrally of the reflective surface, and a second chamber positioned about the first chamber, the wall means defining passage means therethrough for providing communication between the first and second chambers;
   said body means defining first port means communicating with the first chamber, and second port means communicating with the second chamber;
   whereby a fluid can flow through one of the first and second port means, into the chamber communicating therewith, through the wall passage means, into the chamber communicating with the other of first and second port means, and from the other of the first and second port means.

B 521,600

SINGLE PIN GUIDE TRAVERSE

Lawrence W. Rogers, Brewton, Ala., assignor to Monsanto Textiles Company, Pensacola, Fla.

Continuation-in-part of Ser. No. 236,535, March 8, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,600

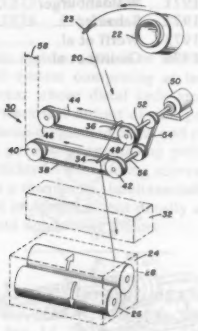
Int. Cl.² B65H *54/30*

U.S. Cl. 242—43 R **6 Claims**

References Cited

UNITED STATES PATENTS

2,340,436	2/1944	Stone et al.	242/158 B
3,633,836	1/1972	Haag	242/43



1. In apparatus wherein yarn is fed from a yarn source to a yarn winding means rotating about an axis, yarn traversing means for traversing said yarn in a plane generally parallel to said axis, said traversing means comprising:

a. a yarn-engaging finger extending through said plane;

b. support means supporting said finger for movement in a closed path in said plane and between said yarn source and said yarn winding means, said path including first and second generally parallel straight segments connected by first and second arcuate end segments, said first and said second segments being generally parallel to said axis, the only contact between said yarn and an element supported by said support means being contact between said yarn and said finger;

c. and guide means for maintaining said yarn in continuous contact with the external surface of said finger at one side of a plane coinciding with the axis of said finger.

B 521,620

ANNULAR ARC ACCELERATOR SHOCK TUBE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Lewis P. Leibowitz, Arcadia, Calif.

Filed Nov. 6, 1974, Ser. No. 521,620

Int. Cl.² G01M *9/00*

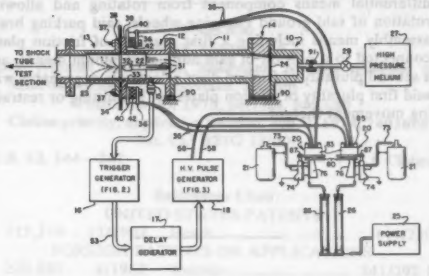
U.S. Cl. 73—147 **9 Claims**

References Cited

OTHER PUBLICATIONS

"Development of an Annular Arc Accelerator Shock Tube Driver", Leibowitz, Jan. 1973, pp. 679–689, of Proceedings of the Ninth International Shock Tube Symposium, Stanford University.

1. In an annular arc accelerator shock tube having a section for initiating a shock wave in a test gas, said shock wave traveling into a test section through electrode sections where energy stored in a bank of capacitors is discharged into the test gas to accelerate the shock wave, the improvement comprising means not interfering with gas flow for detecting said shock wave passing into said electrode sections before discharging said capacitors into said test gas and means responsive to said detecting means for triggering discharge of said energy stored in said bank of capacitors into said test gas immediately behind said shock wave, whereby said test gas is arc heated to accelerate said shock wave into said test section.



B 533,968

DIFFERENTIAL COUPLED PARKING BRAKE AND STEERING PUMP ASSEMBLY

Curtis F. Cummins, Decatur; Kenneth W. Kelly, Warrensburg, and Harold N. Lantz, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 398,387, Sept. 18, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 533,968

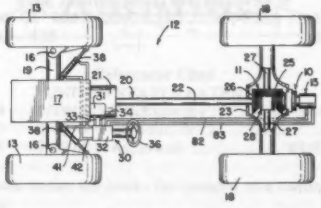
Int. Cl.² B62D *5/06*

U.S. Cl. 180—79.2 R **4 Claims**

References Cited

UNITED STATES PATENTS

1,694,020	12/1928	Price	192/4 B
3,323,389	6/1967	Hause	74/710.5
3,334,703	8/1967	Zeller	180/53 R
3,334,711	8/1967	Anderson	192/4 B X
3,363,728	1/1968	Stengelin	192/4 B X
3,424,262	1/1969	Kunz	180/79.2 R
3,500,970	3/1970	Schilling	188/170
3,532,177	10/1970	Herrman	180/66 R
3,536,230	10/1970	Williams	188/170
3,547,234	12/1970	Cummins	188/170
3,642,103	2/1972	Schott	192/4 A



1. In a vehicle having differential means for transmitting engine torque to ground engaging wheels and having fluid actuated primary steering means; auxiliary steering fluid supply means for supplying fluid under pressure to said steering means in response to rotation of said ground engaging wheels, said steering fluid supply means including adjunctive pinion means for directly engaging an operative component of said differential means and for causing said differential means to drive said auxiliary steering fluid supply means upon rotation

of said ground engaging wheels, parking brake assembly means having means for directly acting upon said adjunctive pinion means to selectively permit or restrain rotation of said adjunctive pinion means to respectively permit or prevent said differential means component from rotating and allowing rotation of said ground engaging wheels, said parking brake assembly means including a first plurality of friction plates connected to a portion of said adjunctive pinion means, and a second plurality of friction discs selectively engageable with said first plurality of friction plates for permitting or restraining movement thereof.

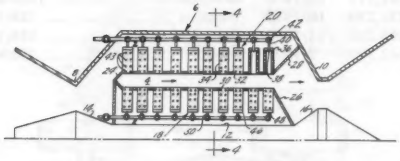
B 534,313
CERAMIC BURNER CONSTRUCTION

Eugene J. Szetela, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,313
Int. Cl.[2] F23C 5/28
U.S. Cl. 431—175 **12 Claims**

References Cited
UNITED STATES PATENTS

2,060,993	11/1936	Keith	431/180
2,777,291	1/1957	Darling	60/39.65
3,247,884	4/1966	McFadden et al.	431/351
3,425,675	2/1969	Twine	431/328
3,671,171	6/1972	Doyle	60/39.65
3,856,455	12/1974	Otway et al.	431/351



1. A burner construction including:
a substantially cylindrical surrounding outer wall;
an inner wall spaced from and enclosed by said outer wall, said inner wall having a plurality of holes therein; and
a plurality of individual burner cans mounted on said inner wall, each burner can having a perforate sidewall and having a fuel nozzle opening at one end, and having the other end attached to one of the openings in the inner wall with the axis of each individual burner extending substantially at right angles to the inner wall, said burners being totally within the cylindrical outer wall.

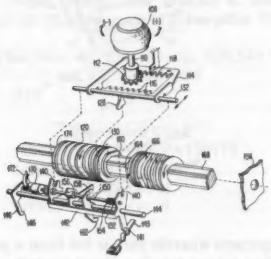
B 535,391
NON RETURN TO HOME RACK SHIFT SELECTION MECHANISM FOR A SINGLE ELEMENT PRINTER

William A. Abell, Jr.; Thomas R. Field; Ralph A. Haus, and Iraj D. Shakib, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,391
Int. Cl.[2] B41J 23/04
U.S. Cl. 197—18 **1 Claim**

References Cited
UNITED STATES PATENTS

3,352,398	11/1967	Crutcher et al.	197/16
3,559,791	2/1971	Waldenburger	197/55
3,572,486	3/1971	Hebel et al.	197/55 X
3,596,745	8/1971	Waldenburger	197/55
3,666,070	5/1972	Schaefer	197/18
3,738,471	6/1973	Werff et al.	197/16 X
3,876,053	4/1975	Giolitti et al.	197/18



1. A printer having a type element mounted for rotation to present different characters to a print position, a pinion connected to said type element for rotation therewith, a drive device comprising a pair of rack members alternately positionable to engage diametrically opposite portions of said pinion, and means for driving an engaged rack member a measured distance wherein the improvement comprises:
a rack selection mechanism for shifting said rack members into and out of engagement, said rack selection mechanism comprising a pivot member spacially fixed with respect to said printhead;
a first cam follower means pivotally mounted on said pivot member;
a second cam follower pivotally supported on said pivot member;
a third cam follower pivotally supported on said pivot member;
said first cam follower means supporting for monoaxial displacement relative thereto, a selectably displaceable member for coupling said first cam follower means alternatively with said second and said third cam followers;
said first cam follower means positively engaging said drive device to impart bidirectional movement to said drive device;
a first cam, rotationally engageable with said first cam follower;
second cam rotationally engageable with said second cam follower, said first and second cam followers spacially displaced such that said first and second followers can not be simultaneously engaged by the respective first and second cams;
third cam engageable with said third cam follower to shift said first cam follower about said pivot member when said displaceable member is engaged with said third follower, said cams being axially movable into and out of engagement with said respective followers.

B 535,466

PATIENT STIMULATING PACER ELECTRODE

Robert Lee Cannon, Waltham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,466
Int. Cl.² A61N 1/04
U.S. Cl. 128—419 P 2 Claims

References Cited
UNITED STATES PATENTS

2,895,479	7/1959	Lloyd	128/417
3,476,116	11/1969	Parsonnet et al.	128/419 P
3,478,746	11/1969	Greatbatch	128/419 PG
3,533,403	10/1970	Woodson	128/419 P
3,572,344	3/1971	Bolduc	128/419 P
3,749,101	7/1973	Williamson	128/419 P
3,804,098	4/1974	Friedman	128/419 P

2. An electrode system capable of use with an electronic heart pacer, said system comprising at least one insulated electrical conductor whose distal ends are electrically connected between electrical output of said pacer and tissue of said heart, said tissue-connected distal end comprising electrically conductive porous means having point contact-welded metallic dust particles for conducting current from said pacer into said tissue in a manner to simultaneously decrease polarization losses and increase current density at the interface of said tissue and said conducting means.

B 541,015

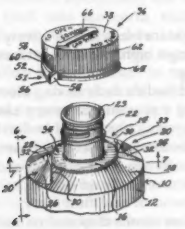
SAFETY CLOSURE MEANS

Efrem M. Ostrowsky, 3600 W. Pratt Ave., Chicago, Ill. 60645

Filed Jan. 14, 1975, Ser. No. 541,015
Int. Cl.² B65D 55/02
U.S. Cl. 215—216 12 Claims

References Cited
UNITED STATES PATENTS

3,854,622	12/1974	McKirnan	215/216
3,877,597	4/1975	Montgomery	215/216



1. Safety closure means comprising, a container and a closure cap therefor, said container having a neck and a shoulder, a locking lug on said shoulder, said cap having a top end wall and a depending annular inner wall and a depending outer annular skirt spaced from said inner wall, said inner wall having means engaging the neck of the container to secure said cap to said container in a closed position, said outer skirt having a radially extending locking lug adjacent the lower end thereof, said cap locking lug adapted when the cap is rotated to cap closing position to pass inwardly of said container locking lug and to be compressed radially inward during said passage and as it moves past the container locking lug to be released from its compressed state so that it extends outwardly beyond the engaging edge of said container locking lug to lock therewith and prevent counter-rotation of said cap, said outer skirt of said cap adapted to be manually engaged and pressed radially inward adjacent said cap locking lug to permit said cap lug to clear the engaging edge of the container lug and ride inwardly of the inside surface of said container lug when the cap is rotated in counter-rotation to permit removal of the cap from the container neck.

B 545,630

KNIFE ASSEMBLY

Erik Wilhelm Sundström, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

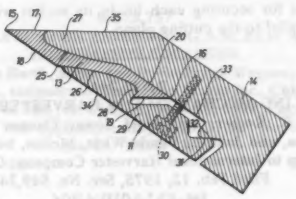
Filed Jan. 30, 1975, Ser. No. 545,630
Claims priority, application Sweden, Feb. 2, 1974, 7401608
Int. Cl.² B27G 13/00
U.S. Cl. 144—241 6 Claims

References Cited
UNITED STATES PATENTS

715,378	12/1902	Heath	144/230

FOREIGN PATENTS OR APPLICATIONS

220,880	4/1962	Austria	241/292.1



1. Cutting insert for knife assembly, said insert having two longitudinal cutting edges (15, 16), the insert being symmetrical after turning on a longitudinal axis (40) for fastening in a holder (14, 29) and exposing one cutting edge at a time for cutting purposes, the cutting edges forming in cross section the acute corners of a parallellogram, the insert also having two longitudinal grooves (27, 28) occupying each of the two obtuse corners of said cross section each of said grooves having a hooked cross section in order to establish a hooked engagement between the cutting insert and the holder.

B 545,935

PRECISION BOOK CUTTER WITH INCLINED BIT

Richard H. Barbour, Jr., Milton, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Filed Jan. 31, 1975, Ser. No. 545,935
Int. Cl.² B26D 7/06; B23D 57/00; B26D 1/12
U.S. Cl. 83—425 8 Claims

References Cited
UNITED STATES PATENTS

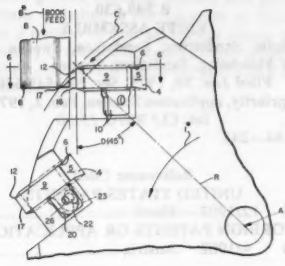
3,297,067	1/1967	Zaichkowsky	144/235 X
3,726,167	4/1973	Barbour, Jr.	83/37
3,822,626	7/1974	Aspinwall	83/925 A X

1. A book cutter for books fed parallel to a cutting plane comprising:

a wheel rotating about an axis normal to the book cutting plane, the wheel forming a plurality of cutting bit sockets inclined at a predetermined angle to the book cutting plane,

cutting bits for respective sockets, each bit having a body received in one of the sockets and a cutting edge bevel at one end of the body inclined to the body at said predetermined angle, the cutting edge formed by the bevel being disposed parallel to the book cutting plane and facing in the direction of book feed at a substantial angle to a radius of the wheel through the edge so as to slice pro-

gressively into the book in the direction of book feed with each rotation of the wheel, and



means for securing each bit in its socket with the bevel parallel to the cutting plane.

B 549,244

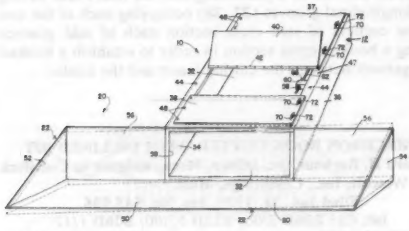
LEVELING MECHANISM FOR HARVESTER HEADERS

Dathan R. Kerber, Bettendorf, Iowa; Thomas A. Hocking, Colona, and John L. Vande Wiele, Moline, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 12, 1975, Ser. No. 549,244
Int. Cl.² A01D *41/04*
U.S. Cl. 56—14.5 **8 Claims**

References Cited
UNITED STATES PATENTS

3,537,243	11/1970	Bichel	56/14.6



1. In an agricultural implement, the combination with a feeder having a generally rectilinear tubular housing provided with a rectangular forward open rim, said housing including a transverse bottom wall, upstanding side walls, and a transverse top wall having a proximate edge fixedly secured to the upper edge of one of said side walls and a free distal edge disposed in longitudinal register with the upper edge of the other side wall, and a crop-gathering header including a bottom wall and an upstanding rear wall which extends across said open rim and is secured thereto, cooperating means on the free distal edge region of said top wall and the adjacent side wall for regulably shifting such region longitudinally along the upper edge of such side wall in either direction to thereby distort the forward rim region of the housing and effect relative vertical shifting movement of forward edge regions of the side walls and consequent rocking movement of the header casing bodily as a unit.

B 549,394

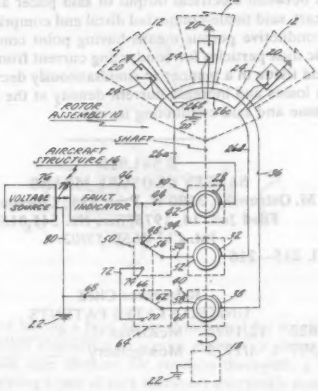
ELECTRICAL INTERCONNECTION CIRCUITRY FROM A ROTATING BODY TO A RELATIVELY STATIONARY BODY

Harry Thomas Jensen, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1975, Ser. No. 549,394
Int. Cl.² B64C *27/32*
U.S. Cl. 416—61 **4 Claims**

References Cited
UNITED STATES PATENTS

1,780,431	11/1930	McCarroll	416/41
2,551,649	5/1951	Taylor	416/61 X
2,838,694	6/1958	Hider	307/145
3,317,759	5/1967	Grobel	307/145
3,547,555	12/1970	Jensen	416/61
3,793,533	2/1974	Ginsberg	307/113
3,896,446	7/1975	Kondoh et al.	416/61 X



1. An electric system including relatively rotating parts with apparatus providing a highly reliable interconnection therebetween, comprising:

first and second bodies each having electrical ground;

means including a plurality of rotary electrical connection means for disposing one of said bodies for rotation on the other of said bodies with electrical contact therebetween;

a power source having first and second outputs and disposed on a first one of said bodies, said first output connected to ground of said first body;

electric utilization means disposed on said first body having a first terminal connected to said second output, and having a second terminal;

electrical sensing means disposed on the second one of said bodies for sensing a condition on said second body and interconnected from ground on said second body to a group of said plurality of rotary electrical connection means; and

circuitry connected to said second terminal of said utilization means, including switch means having an operating position and a test position and being settable to either of said positions alternatively, said circuitry connecting said utilization means to said sensing means through all of said rotary electrical connection means in said group in parallel when said switch means is in said operating position and connecting said utilization means to said sensing means through one of said rotary electrical connection means in said group and connecting said sensing means through at least another one of said rotary electrical connection means in said group to ground of said first body when said switch means is in said test position.

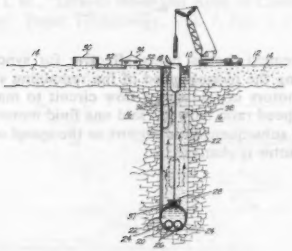
B 554,283

QUICK EGRESS FROM DEEP UNDERGROUND

Nelson Edward Funston, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 28, 1975, Ser. No. 554,283
Int. Cl.² B65G 5/00, 53/00
U.S. Cl. 61—.5 9 Claims

References Cited
UNITED STATES PATENTS
3,608,636 9/1971 Dixon ..... 61/.5 X
FOREIGN PATENTS OR APPLICATIONS
1,059,494 2/1967 United Kingdom 61/.5



1. A method for storing and accessing a container in an environment highly resistive to damage from nuclear attack or other explosive conditions comprising the steps of:

a. excavating a shaft into the earth, said shaft being of a diameter sufficient to allow debris descending in said shaft to bypass a container rising in said shaft and also sufficient to allow said container to negotiate any bends and discontinuities in said shaft, said shaft being of a depth sufficient to provide protection from nuclear blasts for objects buried at said depth;

b. placing first means for the storage of water at the bottom of said shaft, saif first means for the storage of water having means for directing water into said shaft substantially at the bottom thereof;

c. placing pressure means at the bottom of said shaft, said pressure means being in communication with said first means for the storage of water causing water contained in said first means for the storage of water to be discharged through said means for directing water into said shaft when said pressure means is activated;

d. filling said first means for the storage of water with water;

e. affixing a storage container to the bottom of said shaft by tether means, said tether means being able to allow said storage container to rise to the top of said shaft and further being able to draw said storage container to the bottom of said shaft, said storage container being of a density when loaded less than that of quicksand;

f. filling said shaft with saturated sand;

g. using said water contained in said first means for the storage of water to fluidize said saturated sand into quicksand to access said storage container by allowing said storage container to float up to the surface of said quicksand and drawing said storage container down against the buoyant force of said quicksand with said tether means; and,

h. allowing said quicksand to de-fluidize and return to the state of being saturated, compacted sand with said storage container at the bottom of said shaft to store said storage container in a nuclear explosion proof environment.

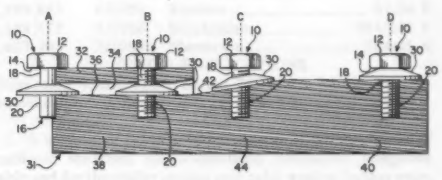
B 575,757

APPARATUS FOR ASSEMBLING A SCREW AND COMPRESSIBLE WASHER

Gerald Dean Barth, Elgin, and David Prugh Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 474,502, May 30, 1974, Pat. No. 3,906,567. This application May 8, 1975, Ser. No. 575,757
Int. Cl.² B21H 3/06
U.S. Cl. 72—88 8 Claims

References Cited
UNITED STATES PATENTS
2,283,494 5/1942 Erdman ..... 72/88 X
2,371,463 3/1945 Olson 72/469
3,163,196 12/1964 Hanneman ..... 72/88 X
FOREIGN PATENTS OR APPLICATIONS
19,847 3/1971 Japan 72/88
1,469,156 12/1965 France ..... 10/155 A



1. A thread rolling die assembly for fabricating a telescoping screw and compressible washer assembly "which includes an axially compressible washer positioned on a screw blank having an unthreaded shank comprising upper and lower regions and a radially enlarged head", said die assembly comprising a workpiece engageable face with a first longitudinal section having an upper portion with screw blank swaging means, slot means extending inwardly from the workpiece engageable face and located directly beneath the upper blank swaging means, the slot means including a ledge adapted to receive and support said compressible washer on the unthreaded screw shank while the upper region of the shank is swaged by the upper swaging means, ramp means adapted to move the washer upwardly on the screw shank as the screw-washer assembly moves longitudinally of the workpiece engageable face and, a second longitudinal die section having thread swaging surfaces adapted to deform the lower region of the

shank into a helical thread form with a crest diameter greater than the inner diameter of the compressible washer.

B 584,520

HYDRAULIC CASCADE DRIVE SYSTEM

Richard M. Rice, c/o Reynolds Metals Company Reynolds Metals Bldg., Richmond, Va. 23261

Continuation of Ser. No. 433,838, Jan. 15, 1974, abandoned.
This application June 6, 1975, Ser. No. 584,520
Int. Cl.² F15B 11/16
U.S. Cl. 60—424 18 Claims

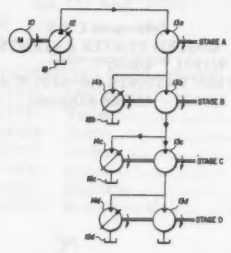
References Cited
UNITED STATES PATENTS

2,846,849	8/1958	Levetus et al.	60/384
3,038,312	6/1962	Marsh	60/420
3,348,624	10/1967	Just et al.	60/484 X

FOREIGN PATENTS OR APPLICATIONS

271,662	2/1951	Switzerland	60/484

1. A cascase fluid drive system comprising:
a power supply having a variable displacement fluid pump and means for driving said pump;
a plurality of fluid motors arranged in series flow circuit with each other and said fluid pump so that a change in the output of said pump tends to cause a change in the output speeds of said fluid motors; and
variable fluid-displacement means for selectively varying the amount of fluid directed to at least one of said fluid motors to change its speed without changing the output speed ratio between said one fluid motor and an adjacent fluid motor in said series flow circuit; said variable fluid-



displacement means being effective for synchronously changing the output speed of the remaining subsequent fluid motors in said series flow circuit to maintain the same speed ratio between said one fluid motor and each of said subsequent fluid motors as the speed of said one fluid motor is changed.

CHEMICAL APPLICATIONS

B 150,142

APPARATUS AND METHOD FOR CONTROLLING THE STOCK FLOW TO A PAPER MACHINE HEADBOX

Abdul-Rahman A. Al-Shaikh, Mount Kisco, N.Y., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 888,431, Dec. 29, 1969, abandoned. This application June 4, 1971, Ser. No. 150,142

Int. Cl.[2] D21F *1/06, 1/08*

U.S. Cl. 162—198 **34 Claims**

References Cited

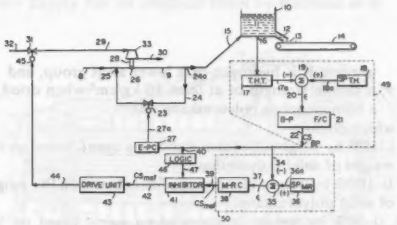
UNITED STATES PATENTS

3,562,104 2/1971 Taylor ..... 162/258 X

OTHER PUBLICATIONS

Pearson, J. H., "Automatic Headbox Operation" Tappi, Vol. 46, No. 10 (10–1963), pp. 192A–195A.

McKnight, I. M., "Dev. in the Wider Appl. of Control to P.M. Flow Boxes" Paper Technology, Vol. 7, No. 1, (1966), pp. 45–52.



1. In a paper machine headbox system including a headbox, a stock pump, a main stock line from said stock pump which branches into a by-pass line which shunts said main stock line and a headbox stock flow line through which stock may flow from said main stock line to said headbox, an apparatus for controlling the stock flow rate in said headbox stock flow line which comprises:

a. first means for providing by-pass flow control signals related to a desired headbox stock flow rate;

b. a by-pass flow control valve in said by-pass line and responsive to said by-pass flow control signals;

c. second means for providing main stock flow control signals;

d. third means, responsive to said main stock flow control signals, for controlling the stock flow rate in said main stock flow line; and

e. logic-inhibit means, logically responsive to said by-pass flow control signals, for inhibiting said third means response to said main stock flow control signals until said by-pass flow control valve exceeds predetermined limits.

B 301,143

HALOAMINE TRANSFER

Jaroslav Vit, Belle Mead, N.J., assignor to National Patent Development Corporation, New York, N.Y.

Filed Oct. 26, 1972, Ser. No. 301,143

Int. Cl.[2] C07C *85/04*

U.S. Cl. 260—534 R **12 Claims**

References Cited

UNITED STATES PATENTS

3,137,728 6/1964 Reid ..... 260/534 R

1. A method of forming a first N-monohaloamine comprising reacting in aqueous solution a second N-monohaloamine with a N-halo free amine corresponding to said first N-haloamine, said second N-haloamine having a stability in aqueous solution substantially equal to or greater than the stability of the first N-monohaloamine and being selected from the group consisting of N-haloamines containing a hydroxy group, a sulfonic acid group, a carboxylic acid group and an N-acetyl group, said N-halo-free amine having 2–11 carbon atoms and containing a carboxylid acid group, and said halogen having an atomic weight of 35 to 127.

B 308,659

METHOD FOR RECLAIMING WATERLOGGED PLASTIC INSULATED CONDUCTOR CABLE

Stanley Kaufman, Flanders, and Raffaele Antonio Sabia, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 208,420, Dec. 15, 1971, Pat. No. 3,733,426. This application Nov. 22, 1972, Ser. No. 308,659

Int. Cl.[2] H01B *11/02, 3/30*

U.S. Cl. 264—36 **4 Claims**

References Cited

UNITED STATES PATENTS

2,889,883 6/1959 Santora ..... 61/36 R

3,248,472 4/1966 Montesano ..... 264/272 X

3,427,393 2/1969 Masterson ..... 264/45 X

OTHER PUBLICATIONS

"Removing Water From Buried PIC Cable" from Bell Laboratories Record, Sept. 1961, pp. 324–326.

1. A method of purging water present in the interstices of multipair sheathed plastic-insulated conductor telephone cable and for thereafter sealing said cable against further entry of water, comprising the steps of:

pumping into said cable a nongelling purgant characterized by complete miscibility in the water present; and thereafter

purging said nongelling purgant and included water therein by

pumping into said cable a gelling purgant characterized by complete miscibility with said first purgant

said gelling purgant characterized by an initial viscosity at the time of said pumping of less than 100 centipoises at any temperature between 35° and 90° Fahrenheit and a capability to gel in a predetermined period of the order of 24 hours after entering into said cable, and wherein said gelling purgant consists of an aromatic solvent oil containing greater than 90 weight percent aromatic molecules and equal amount by weight of a first and a second material, said first material consisting of from 25 to 150 grams of isocyanate prepolymer per liter of solution and said second material consisting of from 80 to 120 grams of hydroxyl-terminated polybutadiene per liter of solution and substantially 4 grams per liter of solution of dibutyl tin dilaurate.

B 349,370

METHOD OF MAKING R-S (O) C NR,R, COMPOUNDS

Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 280,388, Aug. 14, 1972, abandoned. This application Apr. 9, 1973, Ser. No. 349,370.

Int. Cl.² C07D *211/16, 223/02, 217/06*

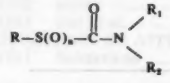
U.S. Cl. 260—239 A 2 Claims

References Cited

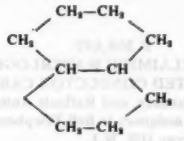
UNITED STATES PATENTS

3,326,663 6/1967 Soloway et al. 71/103

1. A process of manufacturing a pesticidal active compound corresponding to the following formula:

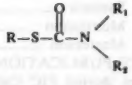


wherein *n* is 1 or 2; R is selected from the group consisting of lower alkyl and lower haloalkyl; R_1 and R_2 taken together form an alkylene group having 2 to 10 carbon atoms, said alkylene group being unsubstituted or substituted with alkyl groups having 1–2 carbon atoms, or R_1 and R_2 taken together form



comprising the steps of:

a. combining an oxidizing agent selected from peracetic acid and m-chloroperoxybenzoic acid and a thiocarbamate compound in a solvent system; said thiocarbamate having the following formula:



b. maintaining the temperature between −25°C. and 60°C.;

c. said oxidizing agent being present in an amount of at least one stoichiometric equivalent and not more than two stoichiometric equivalents.

B 373,354

PLASTIC SHEET ADHERED TO POLYURETHANE IONOMER LATEX FOAM

Paul J. Bocks, Viersen; Jürgen Grammel, Cologne, and Hermann Neumaier, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 25, 1973, Ser. No. 373,354

Claims priority, application Germany, June 27, 1972, 2231411

Int. Cl.² B32B *3/26*

U.S. Cl. 428—315 7 Claims

References Cited

UNITED STATES PATENTS

3,437,197 4/1969 Wirfel 161/160

3,461,103 8/1969 Kerberle et al. 117/132

1. A composite material comprising layers of

a. a plastic sheet with a weight per square meter or 20–300 g/m² and a tensile strength of at least 40 kg/cm² adhered to

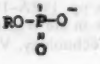
b. a polyurethane ionomer latex foam having a gross density of 0.04 to 0.40 g/cm² produced from aqueous air whipped ionomeric polyurethane dispersions which have

i. a solids content of 45 to 62 % by weight of polyurethane,

ii. a viscosity of 10 to 70 seconds outflow time from a Ford measuring cup with a 4 mm nozzle,

iii. a particle diameter of 0.05 to 1.0 μ

iv. an ionic group content of 3 to 40 milliequivalents per 100 g of polyurethane solids of ions selected from the group consisting of $\geqslant N^{\pm}$, $-COO^{-}$, $-SO_3^{-}$, and



wherein R is hydrogen or a lower alkyl group, and

v. a tensile strength of at least 40 kg/cm² when dried to a homogeneous polyurethane foil,

and which contain

i. 1–10% by weight of a foam stabilizing agent, based on the weight of solid polyurethane,

ii. 0–100% by weight of inorganic fillers based on the weight of solid polyurethane,

iii. 0–30% by weight of crosslinking agent based on the weight of solid polyurethane, and

iv. 0.1 to 10% by weight of thickener based on the weight of solid polyurethane.

B 374,588

METHOD OF INHIBITING GROWTH OF TRANSPLANTED TUMOR CELLS

Gordon H. Svoboda, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 268,406, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 46,811, June 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 840,114, June 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 536,905, March 23, 1966, abandoned. This application June 28, 1973, Ser. No. 374,588

Int. Cl.² A61K *31/435*

U.S. Cl. 424—257 3 Claims

References Cited

OTHER PUBLICATIONS

Chemical Abstracts 45:5696(e) (1951).

Chemical Abstracts 45:9369(f) (1951).

Chemical Abstracts 47:3862(b) (1953).

1. A method of inhibiting the growth of malignant transplanted tumor cells selected from the group consisting of adenocarcinoma, Ad-755; plasma cell myeloma, X-5563; Mecca lymphosarcoma, MLS; B-82 leukemia; C-1498 myelogenous leukemia; Sarcoma 180; Ridgeway osteogenic sarcoma and Shionogi carcinoma which comprises administering to a mouse in whose body the tumor is present and proliferating an effective oncolytic quantity of acronycine.

B 378,513

ELECTRICAL GENERATOR

David L. Purdy, Indiana, Pa., assignor to Coratomic Inc., Indiana, Pa.

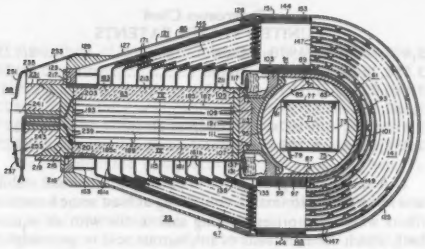
Filed July 12, 1973, Ser. No. 378,513
Int. Cl.² G21H 1/10
U.S. Cl. 136—202 22 Claims

References Cited
UNITED STATES PATENTS

3,076,051	1/1963	Haba	136/201 X
3,262,820	7/1966	Whitelaw	136/202
3,481,794	12/1969	Kasschau	136/208
3,533,913	10/1970	Botts et al.	136/202 UX
3,607,443	9/1971	Purdy	136/202
3,663,306	5/1972	Des Champs et al.	136/202
3,668,015	6/1972	Streb et al.	136/202
3,697,329	10/1972	Bunker et al.	136/202
3,758,346	9/1973	Falkenberg et al.	136/202
3,818,304	6/1974	Hursen et al.	136/202

OTHER PUBLICATIONS

Transactions of A.N.S., Vol. 13, No. 2, Nov. 13, 1970, (pp. 504, 505), Article Entitled, *A Radioisotope Fueled Vapor Cycle Power Supply For An Artificial Heart* by Huffman et al.



1. An electrical generator including a container, a heat source and a thermoelectric unit of the solid-state type having a hot-junction and a cold-junction within said container, means within said container, contacting substantially the whole outer surface of said unit, for applying stress of the hydrostatic type to said unit, and means connecting said hot-junction in heat-deriving relationship with said source.

B 379,177

PROCESS FOR HYDROGEN ISOTOPE CONCENTRATION BETWEEN LIQUID WATER AND HYDROGEN GAS

William H. Stevens, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 104,291, Jan. 6, 1971, abandoned. This application July 13, 1973, Ser. No. 379,177
Claims priority, application Canada, Jan. 28, 1970, 73320
Int. Cl.² B01D 5/02
U.S. Cl. 423—580 13 Claims

References Cited
UNITED STATES PATENTS

2,540,599	2/1951	Segura	252/430
2,575,577	11/1951	Beauchamp	117/135.5
2,690,379	9/1954	Urey et al.	423/580
2,722,504	11/1955	Fleck	208/110
2,976,253	3/1961	Edwards	252/430

1. In an isotope exchange process for hydrogen isotope concentration between liquid water and hydrogen gas, comprising:

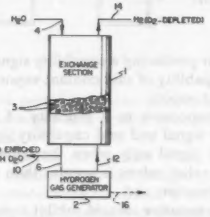
a. contacting at a temperature in the range 15°C to 70°C, in an exchange section, liquid feed water and hydrogen gas from a reaction vessel, with one another and with a catalyst consisting of at least one catalytically active metal selected from Group VIII of the Periodic Table so that the deuterium isotope of hydrogen is transferred to and concentrated in the liquid water passing through and leaving the exchange section in either counter-current or cocurrent flow,

b. passing the liquid water thus enriched with the deuterium isotope of hydrogen concentrated therein to the reaction vessel wherein the hydrogen gas for the exchange section is generated from a portion of the enriched water and then passed through the exchange section, and

c. removing a portion of the water enriched in the exchange section, the improvement comprising:

d. the catalyst is provided in the exchange section as at least one catalyst assembly comprising the catalyst and a substantially liquid-water-repellent organic polymer or resin coating thereon selected from the group consisting of polyfluorocarbons, hydrophobic hydrocarbon polymers of medium to high molecular weight and silicones, and which is permeable to water vapour and hydrogen gas, whereby:

e. the or each catalyst assembly causes hydrogen isotope exchange and concentration in the exchange section as follows:



$$HD\ gas + H_2O\ vapour \xrightleftharpoons{catalyst} H_2\ gas + HDO\ vapour,$$

and

$$HDO\ vapour + H_2O\ liquid \xrightleftharpoons[surface]{liquid\ water} HDO\ liquid + H_2O\ vapour$$

so that direct contact between the catalyst metal and liquid water and wetting of the catalyst is retarded by the coating thereby retarding poisoning of the catalyst by the liquid water.

B 384,330

REACTOR TRIP ON TURBINE TRIP INHIBIT CONTROL SYSTEM FOR NUCLEAR POWER GENERATING SYSTEM

Jose Marcelo Torres, Simsbury, and Charles Ronald Musick, Vernon, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 31, 1973, Ser. No. 384,330
Int. Cl.² G21C 19/00
U.S. Cl. 176—20 R 10 Claims

References Cited
UNITED STATES PATENTS

3,425,903	2/1969	Bevilacqua	176/20
3,671,390	6/1972	Hogle	176/20
3,791,922	2/1974	Musick	176/20

1. A nuclear power generating system comprising:

coolant vapor generating apparatus including a nuclear reactor;

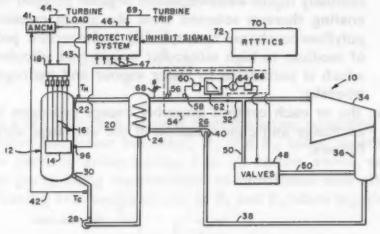
a turbine for receiving coolant vapor produced by said vapor generating apparatus;

coolant circuitry for said coolant vapor generating apparatus and said turbine including means for delivering vapor to said turbine;

a plurality of coolant vapor relief valves in said coolant circuitry, at least one of said valves being operable automatically to divert coolant vapor from said turbine;

a protective system independently responsive to a plurality of signals to cause said nuclear reactor to trip, at least one of said signals being indicative of the occurrence of a turbine trip;

means responsive to the power of said nuclear reactor for producing a power signal commensurate with the power of said nuclear reactor;



means for producing a capability signal commensurate with the capability of said coolant vapor relief valves to divert coolant vapor;

means responsive to a plurality of inputs including said power signal and said capability signal for producing an inhibit signal only when the capability of said coolant vapor relief valves is greater than the power of said nuclear reactor; and

means responsive to said inhibit signal for preventing said protective system from responding to a signal indicative of a turbine trip.

B 385,631

PROCESS FOR PRODUCING CARBIDE ADDITION AGENTS

Frederick H. Perfect, Wyomissing, Pa., assignor to Reading Alloys, Inc., Robesonia, Pa., a part interest

Division of Ser. No. 147,018, May 26, 1971. This application Aug. 6, 1973, Ser. No. 385,631

Int. Cl.[2] B22F *9/00*; C21C *7/00*; C22B *47/00*; C22C *1/04*

U.S. Cl. 75—.5 BA **6 Claims**

References Cited

UNITED STATES PATENTS

1,947,206	2/1934	Kelley	75/1
2,686,117	8/1954	Wulff	75/203
3,013,875	12/1961	Triffleman	75/203
3,334,992	8/1967	Downing et al.	75/.5
3,488,291	1/1970	Haroy et al.	252/301.1
3,504,093	3/1970	Persson	13/26

OTHER PUBLICATIONS

Reiffenstein et al., "Monatshefte Fur Chemie," Vol. 96, No. 5, pp. 1543–1546, (1965).

Schwarzkopf et al., "Refractory Hard Metals," 1953, pp. 187–197.

1. A process for preparing carbide addition agents comprising combining in a finely-divided state

a. carbon

b. an oxide of at least one metal selected from the group consisting of vanadium and columbium, and

c. an oxide of at least one metal selected from the group consisting of iron and manganese into a uniform mixture, compacting said mixture, sintering and reducing said compact mixture at a temperature of from about 1200° to about 1400° C. under a reducing atmosphere, and about atmospheric pressure to form said carbide addition agent the proportional relationship between *a*, *b*, and *c* being such that a point representing the composition of said carbide addition agent, expressed in atomic percent, lies substantially within the area PQRS of FIG. 1.

B 389,304

PROCESS FOR FELT PROOFING AND DIMENSIONALLY STABILIZING TEXTILES MADE OF FIBERS WHICH CONTAIN KERATIN

Karl Schäfer, Opladen; Hans Schuster, Schildgen, and Dieter Dieterich, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 17, 1973, Ser. No. 389,304

Claims priority, application Germany, Sept. 1, 1972, 2243159

Int. Cl.[2] D06M *3/06*, *3/08*, *3/02*, *15/52*, *15/10*

U.S. Cl. 8—115.7 **10 Claims**

References Cited

UNITED STATES PATENTS

3,498,740	3/1970	Cain	8/127.6
3,558,264	1/1971	Habib	8/127.6
3,686,026	8/1972	Schafer et al.	117/141
3,687,605	8/1972	Farmer	8/127.6
3,814,578	6/1974	Pittman et al.	8/127.6
3,832,133	8/1974	Culbertson et al.	8/127.6

1. A single-bath process for imparting dimensional stability and feltproofing to textiles containing at least some keratinous fibers which comprises treating said textile with an aqueous bath which contains salts of sulphurous acid or pyrosulphites as reducing agents and a polyurethane polymer having no free isocyanate groups which contains onium groups.

B 394,248

PREPARATION OF AROMATIC NITROSO COMPOUNDS

John Mathers Woolley, Manchester, England, assignor to Imperial Chemical Industries Ltd., London, England

Filed Sept. 4, 1973, Ser. No. 394,248

Claims priority, application United Kingdom, Sept. 14, 1972, 42693/72

Int. Cl.[2] C07C *81/00*, *81/02*, *81/06*

U.S. Cl. 260—647 **7 Claims**

References Cited

UNITED STATES PATENTS

3,578,720	5/1971	Dodman et al.	260/467

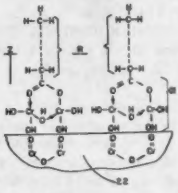
1. In the process for manufacture of nitroso compounds of the benzene series by heating an aromatic nitrobenzene compound with a reducing agent in the presence of a catalyst having a lattice consisting of a heavy metal selected from antimony, bismuth, cerium, chromium, cobalt, copper, germanium, gold, iron, lanthanum, lead, manganese, mercury, molybdenum, neodymium, nickel, rhenium, silver, tantalum, thallium, thorium, tin, titanium, tungsten, vanadium and zirconium, in association with oxygen atoms or hydroxyl, carbonate or phosphate ions and having at least one other of said heavy metals forming impurity in the lattice, the improvement comprising using as the sole reducing agent a member selected from the group consisting of lower aliphatic primary alcohols.

B 409,848
COMPOSITION FOR BOUNDARY LUBRICANT AND METHOD

James J. Licari, Whittier, and Robert Willing, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 26, 1973, Ser. No. 409,848
Int. Cl.² C23C 1/10
U.S. Cl. 427—372 **9 Claims**

References Cited
OTHER PUBLICATIONS
Metal Organic Compounds, "Chromium Complexes" Hauserman; 1959 ACS, pp. 339–356.



1. A method of boundary lubricating a wear surface, said method compirising:
   forming a chlorine-free metallic coordination complex of a long chain fatty acid, wherein said fatty acid is selected from an homologous carboxylic series and wherein the metallic constituent is a transition metal capable of forming coordination complexes selected from Cr, Mn, Fe, Co, Ni, and Al, by;
   reducing an oxide of said transition metal to an acetate of said transition metal,
   hydrating said acetate of said transition metal, olating the product of said hydrating step,
   forming a coating of said chlorine-free metallic coordination complex on said wear surface; and
   heating the coated wear surface to polymerize said metallic coordination complex and to anchor said complex to said wear surface.

B 423,883
CHARGED PARTICLE MODULATOR DEVICE AND IMPROVED IMAGING METHODS FOR USE THEREOF

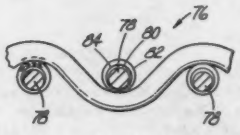
John D. Blades, Chagrin Falls, and Jerome E. Jackson, Shaker Heights, both of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 12, 1973, Ser. No. 423,883
Int. Cl.² G03G 13/044
U.S. Cl. 96—1 R **30 Claims**

References Cited
UNITED STATES PATENTS

3,615,395	10/1971	Yamaji et al.	96/1 R
3,625,604	12/1971	Pressman	96/1 R
3,645,614	2/1972	McFarlane et al.	96/1 R
3,666,365	5/1972	Tanaka et al.	96/1 R
3,680,954	8/1972	Frank	96/1 R
3,694,200	9/1972	Pressman	96/1 R

1. The method of making a developable image from a graphic original by creating a charge pattern on a dielectric medium through the use of a modulator adapted to selectively transmit charged particles in the presence of an electric field comprising the steps of:
   1. creating a charge distribution system on said modulator wherein said modulator comprises a transparent insulating layer overlying a photoconductive medium deposited on a conductive screen by carrying out the steps of:
      a. simultaneously applying a blanket electrostatic charge and exposing the insulating layer to electromagnetic radiation;
      b. projecting a pattern of light and shadow on the surface of the insulating layer of the modulator simultaneous with the application of AC corona charge; and
      c. illuminating the insulating layer overall with electromagnetic radiation, and which charge distribution system persists on the modulator in the presence of radiation in the visible portion of the spectrum;



   2. directing charged particles of one polarity against the conductive screen while said screen is connected to a reference potential;
   3. positioning an electrode on the side of the modulator opposite the side against which the charged particles are directed, said electrode being connected to a high voltage source which is opposite in polarity to said charged particles;
   4. removably affixing said dielectric medium to said electrode whereby said charged particles are selectively transmitted through certain portions of said modulator to produce a developable image on said dielectric medium.

B 430,334
OXIDATIVE HAIR DYE COMPOSITIONS CONTAINING N-SUBSTITUTED O-PHENYLENEDIAMINES AND METHOD FOR THEIR USE

Alexander Halasz, Norwalk, Conn.; Frederick Brody, deceased, late of Greenwich, Conn., and by Richard Newman, executor, New York, N.Y., assignors to Clairol Incorporated, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,334
Int. Cl.² A61K 7/13
U.S. Cl. 8—10.2 **26 Claims**

References Cited
UNITED STATES PATENTS

923,635	6/1909	Erdmann	8/10.2
3,200,040	8/1965	Lange	8/10.2 X
3,210,252	10/1965	Blanke et al.	8/10.2
3,236,891	2/1966	Seemuller	8/10.2 X
3,337,411	8/1967	Wilmsmann et al.	8/10.2
3,415,608	12/1968	Tucker	8/10.2

FOREIGN PATENTS OR APPLICATIONS

518,199	2/1931	Germany	8/10.2

OTHER PUBLICATIONS
Heilingotter, Parfumerie Modern, Vol. 48, (1955), pp. 55–60.

1. An oxidation hair dyeing composition comprising a water containing hair dye carrier and a tinctorially effective amount of an o-phenylenediamine of the formula:

wherein R is alkyl having 1 to 4 carbon atoms.

B 437,596

HIGH QUALITY BLENDED JET FUEL COMPOSITION

Merritt C. Kirk, Jr., McKinney, Tex., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 30, 1974, Ser. No. 437,596.
Int. Cl.² C10L *1/04*
U.S. Cl. 208—15 9 Claims

References Cited
UNITED STATES PATENTS

3,146,186	8/1964	Leas et al.	208/15
3,231,489	1/1966	Mahar	208/15
3,242,066	3/1966	Myers	208/15
3,507,776	4/1970	Hann	208/15
3,594,307	7/1971	Kirk	208/15
3,788,971	1/1974	Kirk	208/15

1. A composition having a freezing point lower than −40°F, comprising a blend of (A) a straight-run paraffinic kerosene in which the aromatic hydrocarbons have been reduced to provide a smoke point greater than 28 and (B) in the range of 23.5 to 40 volume percent of n-decane.

B 452,883

PROCESS FOR MAKING A STABLE, RELATIVELY HIGH CONCENTRATION, SOLUTION OF AN ORGANIC COLOR-REACTIVE COLORLESS DYE IN OIL

Minoru Murata; Koichi Sugiyama, both of Hiratsuka, and Hisao Ikeda, Fujisawa, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 20, 1974, Ser. No. 452,883
Claims priority, application Japan, Apr. 16, 1973, 48-43005
Int. Cl.² C09D *11/06*
U.S. Cl. 106—27 11 Claims

References Cited
UNITED STATES PATENTS

2,755,202	7/1956	Balon	117/36.2
2,755,203	7/1956	Stallmann	117/36.2
3,447,944	6/1969	Werner	117/36.8
3,653,945	4/1972	Davis	117/36.8

1. A stable, colorless, liquid ink composition comprising an organic peroxide compound dissolved in substantially water insoluble organic oil and complexed with a color reactive dye material.

B 453,759

METHOD FOR PREPARING SILICONE RUBBER MOLDS

Leonard Bretz Bruner, Manchester, Mich., and Kenneth Elmon Koch, Jr., Chelmsford, Mass., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Mar. 22, 1974, Ser. No. 453,759
Int. Cl.² B29C *1/02*
U.S. Cl. 264—225 11 Claims

References Cited
UNITED STATES PATENTS

3,190,947	6/1965	Norcross	264/225
3,222,443	12/1965	Dames, Jr. et al.	264/337
3,303,246	2/1967	Forrest	264/225
3,504,079	3/1970	Hall	264/225
3,792,147	2/1974	Wohlfarth et al.	264/225
3,825,618	7/1974	Pepe	260/37 SB

OTHER PUBLICATIONS

"Flexible Urethane Molds for the Furniture Industry," SPE Journal, June 1969, Vol. 25, pp. 53–55.

1. A method for preparing a silicone mold having dimensional stability which comprises (1) applying to that portion of a stationary pattern which is vulnerable to high stress a room temperature curable silicone composition (a) having a 5 minute Williams plasticity value of from 60 to 140, said silicone composition (a) is prepared by forming a mixture containing a hydroxylterminated organopolysiloxane having a 30 second Williams plasticity value above about 100, sufficient filler to provide a 5 minute Williams plasticity value of from 60 to 140, a cross-linking agent and a catalyst capable of curing the silicone composition to an elastomeric solid at room temperature, (2) applying a room temperature curable silicone composition (b) which is compatible with silicone composition (a) and has a viscosity of from 5,000 to 80,000 cs. at 25°C. to the remainder of the pattern, said silicone composition (b) is prepared by forming a mixture containing a hydroxyl-terminated organoplysiloxane having a viscosity of from 100 to 40,000 cs. at 25°C., sufficient filler to provide a viscosity of from 5,000 to 80,000 cs. at 25°C., a cross-linking agent and a catalyst capable of curing the silicone composition to an elastomeric solid at room temperature, (3) curing the silicone compositions at ambient temperature and thereafter (4) removing the silicone mold from the pattern.

B 457,862

CERTAIN BROMOACETOXY ACETYLENES USED AS BACTERICIDES

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 299,990, Oct. 24, 1972, abandoned, which is a division of Ser. No. 853,950, Aug. 28, 1969, Pat. No. 3,711,271. This application Apr. 4, 1974, Ser. No. 457,862
Int. Cl.² A01N *9/24*
U.S. Cl. 424—311 4 Claims

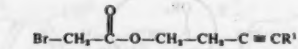
References Cited
UNITED STATES PATENTS

2,931,754	4/1960	Baldridge	260/487
3,711,271	1/1973	Baker	424/311 X

OTHER PUBLICATIONS

Chemical Abstracts, 61:5509f (1964).

1. A method of killing bacteria comprising applying thereto a bactericidally effective amount of a compound having the formula



in which R^1 is selected from the group consisting of methyl and ethyl.

B 460,388

OVERPRINT OF SOLVENT ON TOTAL SOLVENT COATING

Walter J. Bohrn, 1924 Ridgeview Ave., Lancaster, Pa. 17603

Filed Apr. 12, 1974, Ser. No. 460,388
Int. Cl. D44d *1/02*
U.S. Cl. 8—14 **3 Claims**

References Cited
UNITED STATES PATENTS

705,977	7/1902	Timme	26/2 R
2,681,867	6/1954	Miller	8/114.5
3,402,988	9/1968	Reeves et al.	8/114
3,567,548	3/1971	Miller	117/72
3,830,683	8/1974	Bohrn	161/63
3,849,157	11/1974	Polmer et al.	156/277
3,849,158	11/1974	Polmer et al.	156/277
3,849,159	11/1974	Polmer et al.	156/277
3,856,598	12/1974	Gregorian et al.	156/85

1. The method of forming an embossed pattern effect on pile fabric material which consists of the steps of:
   a. first providing a carpet material with a backing and a pile upper face surface, the pile face surface containing fibers which may be shrunk by a selected solvent while the backing material will be unaffected by the solvent solution,
   b. applying a first solvent solution to the total fiber face surface of the carpet to saturate the full length of the fibers with solvent solution, said solvent solution applied being of a concentration that can cause shrinkage of the pile face surface fibers,
   c. subsequently applying to only selected areas of the fiber face in a desired pattern a second solution which will dilute the total originally applied solvent-containing solution in the pattern areas to the point that the solvent now in the total solution will have little or no effect upon the fibers of the pile surface to shrink the fibers, and
   d. thereafter subjecting the pile fabric to heat to cause the yarns in the fiber face surface which have been only wetted by the first solvent-containing solution to shrink and present a desired embossed pattern appearance since in those areas where there has been the printing of the second solution, the solvent concentration has been diluted to the point that the solvent has very little or no shrinkage effect upon the fibers of the pile surface and, therefore, a two-level pile surface results.

B 465,688

THERMOPLASTIC MOULDING COMPOSITIONS

Richard Prinz, Leverkusen; Salah Elabd Elghani, Cologne; Winfried Fischer, Cologne, and Heinrich Alberts, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 30, 1974, Ser. No. 465,688
Claims priority, application Germany, May 4, 1973, 2322435
Int. Cl.² C08L *67/06*
U.S. Cl. 260—873 **12 Claims**

References Cited
UNITED STATES PATENTS

3,164,651	1/1965	Chu	260/33.4 R
3,597,498	8/1971	Christensen	260/873
3,855,353	12/1974	Alberts et al.	260/878 R

FOREIGN PATENTS OR APPLICATIONS

917,499	2/1963	United Kingdom	260/878 R

1. A thermoplastic molding composition comprising
   i. from 5 to 95 percent by weight of at least one polycarbonate derived from a divalent phenol and
   ii. from 95 to 5 percent by weight of at least one graft copolymer comprising
   a. from 10 to 70 percent by weight of an ethylene/vinyl acetate copolymer containing from 25 to 75 percent by weight of vinyl acetate having grafted thereon
   b. from 90 to 30 percent by weight of a copolymer prepared from a monomer mixture comprising
      1. from 15 to 85 parts by weight of acrylonitrile, methacrylonitrile or a mixture thereof and
      2. from 10 to 85 parts by weight of styrene, α-methylstyrene or a mixture thereof.

B 466,929

METHOD OF CONTROLLING BACTERIA

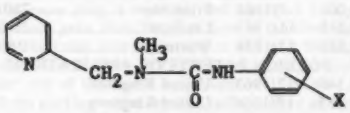
Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 6, 1974, Ser. No. 466,929
Int. Cl.² A01N *9/22*
U.S. Cl. 424—263 **4 Claims**

References Cited
UNITED STATES PATENTS

3,700,678	10/1972	Mihailovski	260/245 E

1. A method of inhibiting the growth of bacteria selected from the group consisting of *Bacillus cereus*, *Brevibacterium ammoniagenes*, *Staphylococcus aureus* and *Desulfovibrio desulfuricans* comprising contacting the bacteria with an effective amount of a compound having the formula:



wherein X is selected from the group consisting of 4-trifluoromethyl, 3-nitro and 3-trifluoromethyl.

B 480,702

MASS OR HEAT TRANSFER

Bernard J. Lerner, 727 Orchard Hill Drive, Pittsburgh, Pa. 15238

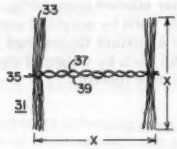
Filed June 19, 1974, Ser. No. 480,702
Int. Cl.² B01F *3/04*
U.S. Cl. 261—98 **9 Claims**

References Cited
UNITED STATES PATENTS

1,700,126	1/1929	Goodloe	55/477
1,848,576	3/1932	Sandel	55/249 X
2,027,906	1/1936	Hand	55/477
2,143,015	1/1939	Kleinschmidt	261/96
2,528,303	10/1950	Gillespie	55/477 X
2,610,893	9/1952	Collins et al.	261/94 X
2,615,699	10/1952	Dixon	261/94 X
3,135,592	6/1964	Fairs et al.	261/95 X
3,243,170	3/1966	Ellis et al.	261/94
3,385,574	5/1968	Lohman	261/92
3,410,057	11/1968	Lerner	55/97
3,700,590	10/1972	Burton	210/150 X
3,777,457	12/1973	Laube	55/259 X
3,885,929	5/1975	Lyon et al.	55/259 X

FOREIGN PATENTS OR APPLICATIONS

828,545	12/1969	Canada	55/527



1. In a column for mass and/or heat transfer by counterflow of a liquid and gas, a plurality of bodies forming a bed, each body having an axial support form which a large number of bristles extend radially, said bodies being disposed at random with reference to each other with the bristles of contiguous bodies interlocked whereby the number of bristles per unit volume of said column varies spatially in all directions from point to point of said bed throughout said bed.

B 483,606

FLAME RETARDANT POLYURETHANE FOAM CONTAINING POLYALKYLENE GLYCOL ALKYL POLY-PHOSPHITES

Silvio L. Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, Dobbs Ferry, N.Y.

Continuation of Ser. No. 322,595, Jan. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,295, July 26, 1971, abandoned. This application June 27, 1974, Ser. No. 483,606
Int. Cl.² C08G *18/14*, *18/50*
U.S. Cl. 260—2.5 AR **4 Claims**

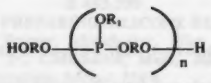
References Cited
UNITED STATES PATENTS

3,263,001	7/1966	Friedman	260/2.5 AR
3,354,241	11/1967	Larrison	260/929
3,850,859	11/1974	Wortmann	260/2.5 AJ

FOREIGN PATENTS OR APPLICATIONS

945,340	12/1963	United Kingdom
978,285	12/1964	United Kingdom

1. A flame retardant polyurethane foam containing, as a chemically bonded, integral part thereof, the residue of a polyalkylene glycol polyphosphite having the formula:



wherein R_1 is an alkyl residue, R is a polyalkylene glycol residue and *n* is a number from about 4 to about 50.

B 485,401

VACUUM STRIPPING OF AMMONIA

Louis I. Blaine, South Orange, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed July 3, 1974, Ser. No. 485,401
Int. Cl.² C01C *3/00*
U.S. Cl. 423—238 **9 Claims**

References Cited
UNITED STATES PATENTS

2,808,125	10/1957	Back et al.	55/70
3,038,285	7/1962	Maurouc	55/70
3,428,426	2/1969	Carney et al.	55/70
3,448,042	6/1969	Mattia et al.	210/26
3,758,277	9/1973	Cook et al.	423/396
3,775,088	11/1973	Higgins	423/396
3,804,757	4/1974	Ruschenburg	55/70

FOREIGN PATENTS OR APPLICATIONS

265,576	9/1964	Australia	423/238
334,179	6/1970	U.S.S.R.	423/237

1. A method for stripping ammonia from a spent alkaline regenerant solution used for the regeneration of a zeolite ion exchange bed; comprising the steps of:

a. directing the spent alkaline regenerant solution downwardly through a stripping column;
b. passing a gas upwardly through the column countercurrent to the flow of alkaline regenerant solution;
c. circulating an acidic working solution continuously from a holding tank through a vacuum creating means and then back into the holding tank; and
d. withdrawing stripped ammonia from the stripping column under a vacuum created therein by said vacuum creating means so as to cause said stripped ammonia to chemically react with said acidic working solution to form an ammonium salt solution.

B 487,133

METHOD OF KILLING INTERNAL PARASITES USING SALICYLANILIDES

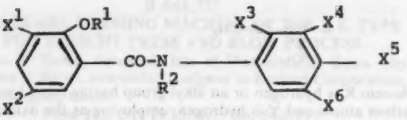
Bruce Adam Forsyth, Croydon, and David Ernest Pryor, Balwyn, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Division of Ser. No. 355,813, April 30, 1973. This application July 10, 1974, Ser. No. 487,133
Claims priority, application Australia, May 12, 1972, 8942/72; Aug. 3, 1972, 9940/72; Dec. 5, 1972, 1505/72
Int. Cl.² A61K *31/60*
U.S. Cl. 424—230 **7 Claims**

References Cited
UNITED STATES PATENTS

3,801,637	4/1974	Meek	424/324
3,823,236	7/1974	Buchel et al.	424/230

1. A method of killing internal parasites in warm blooded animals comprising administering orally or parenterally to an infected animal an effective amount of a compound of the formula:



where R^1 is hydrogen or acetyl, R^2 is hydrogen, acetyl or lower alkyl, X^1 and X^2 are iodine atoms; X^3, X^4, X^5 and X^6 which may be the same or different are chlorine, bromine, iodine, trifluoromethyl or hydrogen; at least two and not more than two of X^3, X^4, X^5 and X^6 are hydrogen; when X^3 is chlorine, bromine, iodine or trifluoromethyl, then X^4 and X^6 are both hydrogen; and at least one of X^3, X^4, X^5 and X^6 is trifluoromethyl, said compound being administered in a dosage amount of from 1 to 50 mg per Kg animal bodyweight.

B 502,589

POLYALKYLENE GLYCOL ALKYL OR HALOALKYL POLYPHOSPHONATES USED AS FLAME RETARDANTS IN POLYURETHANE FOAM

Kyung Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 282,642, Aug. 21, 1972, Pat. No. 3,855,360. This application Sept. 3, 1974, Ser. No. 502,589

Int. Cl.³ C08G *18/14*, *18/50*

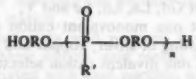
U.S. Cl. 260—2.5 AR **9 Claims**

References Cited

UNITED STATES PATENTS

3,333,027	7/1967	Larrison	260/969
3,354,241	11/1967	Larrison	260/2.5 AR
3,359,348	12/1967	Friedman	260/2.5 R
3,538,196	11/1970	Baranauckas	260/969
3,772,222	11/1973	Steward	260/2.5 AR
3,855,360	12/1974	Shim	260/929

1. A flame retardant polyurethane foam containing as a chemically bonded integral part thereof, the residue of a polyalkylene glycol alkyl or haloalkyl polyphosphonate characterized by an acid number in water of below about 15 mg. of KOH per gram of sample, having the formula:



wherein R is the residue of a polyalkylene glycol having the formula:

wherein R'' is an alkylene radical of 2 to about 20 carbon atoms and x is a number from 2 to about 20, R' is alkyl or haloalkyl and n is a number in the range from about 2 to about 50.

B 503,029

ROLL FASTENING FOR ROLL FILMS

Ralf L. Klinkhammer, Cologne, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 3, 1974, Ser. No. 503,029

Claims priority, application Germany, Sept. 7, 1973, 2345260

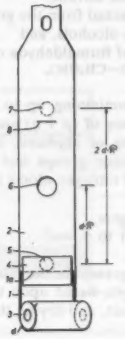
Int. Cl.² G03C *3/02*

U.S. Cl. 96—78 **2 Claims**

References Cited

UNITED STATES PATENTS

1,828,955	10/1931	Bornmann	96/78
1,944,132	1/1934	Naewiger	96/78
2,188,779	1/1940	Roehrl	96/78



1. A roll fastening for roll films or cassette films comprising a leader having an outer end and a lateral width, in which the beginning of the film is stuck to the leader a short distance from its outer end by means of an adhesive strip, wherein a first hole is punched into a region of the leader which is in contact with the adhesive strip so that part of the tacky surface of the adhesive strip is exposed, and a second hole with a larger surface area than the first hole is punched into the leader at the same lateral position as and at a distance $d.\pi$ (d-roll diameter) from the first hole between the first hole and the outer end of the leader to prevent the first turn of the leader from sticking to the exposed tacky surface of the adhesive strip and whereby the second turn sticks to the tacky surface of the adhesive strip which is exposed through the first and second holes to form a bond by which the outermost turn of the leader is lightly bonded about the roll.

B 519,377

METHOD OF DRESSING LEATHER

Kuno Wagner, Leverkusen-Steinbuechel, and Walter Schroer, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 427,290, Dec. 21, 1973, Pat. No. 3,880,784. This application Oct. 30, 1974, Ser. No. 519,377
Claims priority, application Germany, Dec. 23, 1972, 2263204
Int. Cl.² B05D *3/02*; B32B *9/02*
U.S. Cl. 427—389 **2 Claims**

References Cited
UNITED STATES PATENTS

3,043,801	7/1962	Wagner et al.	260/841
3,142,699	7/1964	Wagner et al.	260/89.5 R
3,472,802	10/1969	Bownes et al.	260/77.5 MA
3,484,404	12/1969	Collardeau et al.	260/77.5 SS
3,551,468	12/1970	Chadwick	260/77.5 SS
3,677,813	7/1972	Eckert et al.	427/389 X

1. The method of dressing leather which comprises applying to the leather a stable solution of a high-molecular weight diisocyanate polyaddition product in a solvent mixture, said solvent mixture comprising

a. an inert organic solvent,

b. an alcohol selected from the group consisting of primary and secondary alcohols, and

c. a semiacetal of formaldehyde of the formula

$$(HO)_p—R'—(O—CH_2OH)_q$$

wherein

R is a radical containing up to about 20 carbon atoms, having a valency of $(p + q)$ and being selected from the class consisting of aliphatic, cycloaliphatic, araliphatic and trialkylamine groups and such groups substituted with alkylated nitrogen atoms and

wherein

p and q are integers,

$(p + q)$ is from 1 to 6, and

p is from 0 to 3,

the alcohol being present in the mixture in a proportion of at least 25% by weight, based upon the dissolved diisocyanate polyaddition product, and drying the treated leather.

B 521,324

EPOXIDATION OF OLEFINS WITH LESS STABLE ORGANIC HYDROPEROXIDES BY USING AN ALCOHOL STABILIZING AGENT

Ming N. Sheng, Cherry Hill, N.J.; John G. Zajacek, Strafford, Pa., and Thomas N. Baker, III, Sudbury, Mass., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 290,592, Sept. 20, 1972, Pat. No. 3,862,961, which is a continuation-in-part of Ser. No. 95,375, Dec. 4, 1970, abandoned. This application Nov. 6, 1974, Ser. No. 521,324
Int. Cl.² C07D *301/20*
U.S. Cl. 260—348.5 L **6 Claims**

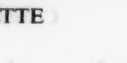
References Cited
UNITED STATES PATENTS

3,434,975	3/1969	Sheng et al.	252/431
3,489,775	1/1970	de Roch et al.	260/348.5 L
3,502,740	3/1970	Zajacek et al.	260/681
3,526,645	9/1970	Vangermain et al.	260/348.5 L
3,538,124	11/1970	Sheng et al.	260/348.5 L
3,649,648	3/1972	Fetterman	260/348.5 L

FOREIGN PATENTS OR APPLICATIONS

641,452	12/1963	Belgium
807,186	2/1969	Canada
799,502	11/1968	Canada

1. A method for the epoxidation of olefins characterized by having the formula



wherein R is hydrogen or an alkyl group having from 1 to 17 carbon atoms and Y is hydrogen, employing as the oxidizing agent a less stable organic hydroperoxide selected from the group consisting of cyclohexyl hydroperoxide and amylene hydroperoxide which compirses contacting said olefin with said hydroperoxide in the presence of a molybdenum-containing catalyst and as a stablilizing compound cyclohexanol at a temperature ranging between 50°C. to 140°C. under a pressure of at least the autogenous pressure of the reaction at the temperature employed, and with the mole ratio of said stabilizing compound to said hydroperoxide being in the range of from about 1:1 to 3:1.

B 535,813

LUMINESCENT SULFIDES OF MONOVALENT AND TRIVALENT CATIONS

Perry Niel Yocom, Princeton, and John Pickett Dismukes, South Branch, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,813
Int. Cl.² C09K *11/08*
U.S. Cl. 252—301.4 S **7 Claims**

References Cited
UNITED STATES PATENTS

3,418,216	12/1968	Royce	252/301.4
3,801,702	4/1974	Donohue	252/301.4
3,850,837	11/1974	Nath	252/301.4

OTHER PUBLICATIONS

Chandron, M. G.; C. R. Acad. Sc. Paris; t273 Serie C; Oct. 11, 1971, pp. 849–851.

1. A luminescent material, having a crystal structure similar to that of alpha sodium ferric oxide and the empirical formula

$$(\alpha\ Ma\ \gamma\ Mc\ \delta/2\ Md)\ (\beta\ Mb\ \delta/2\ Md\ \epsilon\ Me)\ S_t$$

wherein:

Ma is at least one monovalent cation selected from the group consisting of Na, K, Rb and Cs,

Mb is at least one trivalent cation selected from the group consisting of Gd, La, Lu, Sc and Y,

Mc is at least one monovalent cation selected from the group consisting of silver, copper and thallium,

Md is at least one divalent cation selected from the group consisting of europium, manganese, lead and tin,

Me is at least one trivalent cation selected from the group consisting of arsenic, bismuth, cerium, dysprosium, erbium, praseodymium, antimony, samarium, terbium and thulium,

S is sulfur,

α is 1.00 minus γ minus $\delta/2$,

β is 1.00 minus ϵ minus $\delta/2$,

γ, δ and ϵ are each in the range of 0.00 to 0.05 mol, and

γ plus δ plus ϵ is in the range of 0.005 to 0.05 mol.

B 545,777

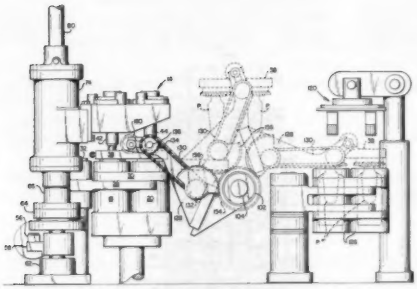
GLASSWARE FORMING MACHINE OF THE I. S. TYPE FOR UPRIGHT PRESS AND BLOW PROCESS

George E. Rowe, deceased, late of Wethersfield, Conn. (by Selma S. Rowe, executrix), assignor to Emhart Corporation, Farmington, Conn.

Filed Jan. 31, 1975, Ser. No. 545,777
Int. Cl.² C03B 9/00, 9/14
U.S. Cl. 65—239 12 Claims

References Cited
UNITED STATES PATENTS

690,119	12/1901	O'Neill	65/361 X
1,745,794	2/1930	Hatch	65/229
1,911,998	5/1933	Hutchinson	65/241
2,018,030	10/1935	O'Neill et al.	65/239
3,169,846	2/1965	Zappia	65/241 X
3,329,492	7/1967	Kinsley	65/361 X
3,434,820	3/1969	Zappia et al.	65/229 X
3,490,891	1/1970	Fouse	65/239 X



1. A glassware forming machine comprising:

a. a blank mold station having an upwardly open blank mold cavity defining structure for receiving the gobs of glass to be formed,

b. partible neck ring mold structures for mating with said blank mold cavity defining structure at said blank station,

c. parison neck forming means for insertion downwardly into the closed neck ring molds at said blank station,

d. a final blow station horizontally spaced from said blank station and having upwardly open blow mold cavity defining structure for receiving the partially formed parisons from said blank station,

e. means for transferring said parisons from said blank station to said blow station, said means including neck ring arms associated with said partible neck ring mold structures and means pivotally supporting said arms for movement about a horizontal axis located between said blank mold and blow mold stations, and

f. said transferring means further including means pivotally supporting each neck ring structure adjacent the free end of its associated neck ring arm, said neck ring mold structures supporting the parison during transfer from said blank to said blow station and also keeping the parison in an upright orientation during such transfer.

B 565,180

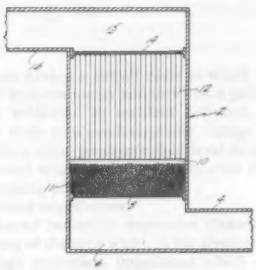
MONOLITHIC CATALYTIC CONVERTER HAVING FLUIDIZED ABRASIVE PARTICLES BED FOR MAINTAINING CATALYST ACTIVITY

Francis J. Fennessy, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 427,872, Dec. 26, 1973, abandoned. This application Apr. 4, 1975, Ser. No. 565,180
Int. Cl.² B01J 8/18, 8/24; F01N 3/15, 5/04
U.S. Cl. 23—288 F 4 Claims

References Cited
UNITED STATES PATENTS

2,222,884	11/1940	Stowe	23/288 R
2,747,976	5/1956	Houdry	23/288 F
2,772,147	11/1956	Bowen et al.	23/288 F
2,880,079	3/1959	Cornelius	23/288 F
3,110,300	11/1963	Brown et al.	23/288 F
3,184,291	5/1965	Calvert	23/288 F
3,186,804	6/1965	Fisher	23/288 F
3,307,920	3/1967	Barnes	23/288 F
3,740,925	6/1973	Gothard	23/288 R
3,754,870	8/1973	Carnahan et al.	23/288 F



1. A catalytic reactor for purifying exhaust gases including:

a vertically disposed chamber having a bed of abrasive particles in the bottom thereof;

a first porous screen for supporting the particles;

a catalytic structure above the particles and mounted in the chamber, said structure having vertical passages defining substantially vertical catalytic surfaces, each of said vertical passages extending from the bottom of said structure to the top thereof and providing for the unimpeded flow of gases therethrough, the abrasive particles being substantially smaller than the passages for movement of the particles vertically in both directions in the passages;

a second porous screen at the top of said catalytic structure for preventing loss of said particles from said reactor;

the bottom end of the catalytic structure being spaced above the top surface of the bed of particles to leave a clearance space therebetween; and

said reactor having an inlet located below said first porous screen and an outlet at the top of the reactor above the top of said second porous screen for passing exhaust gases upwardly through the bed and through the catalytic structure for purifying said exhaust gas and fluidizing said bed such that the particles abrade the catalytic surfaces.

B 592,143

MAGNETIC SPEED SENSOR WITH COMPENSATING POLE

Rex Wallace Presley, 36722 Marler, Livonia, Mich. 48154

Continuation of Ser. No. 478,988, April 4, 1975. This application July 1, 1975, Ser. No. 592,143

Int. Cl.[2] H02K *21/38*

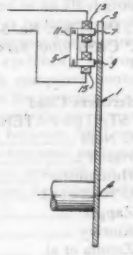
U.S. Cl. 310—155 5 Claims

References Cited

UNITED STATES PATENTS

2,161,256	6/1939	Karcher	310/155 X
2,756,357	7/1956	Schaberg	336/135 X
2,820,915	1/1958	Mathews	310/168
2,853,638	9/1958	Bonnano et al.	310/155 UX
3,564,313	2/1971	Goor	310/168
3,825,782	7/1974	Dassler	310/168

1. A speed sensor for a vehicle wheel comprising a tone wheel driven by the vehicle and subject to axial misalignment and vibration, the tone wheel being made of magnetic material and having a continuous portion and a toothed portion, and sensing means having a sensing pole at one side of the tone wheel proximate the toothed portion and a compensating pole at the same side of the tone wheel proximate the continuous portion and remote from the toothed portion, coil means on the poles, and means for magnetizing the poles to induce a



signal voltage across the coil means corresponding to wheel speed and substantially free of noise components due to axial misalignment and vibration of the tone wheel upon relative rotation of the tone wheel and sensing means.

ELECTRICAL APPLICATIONS

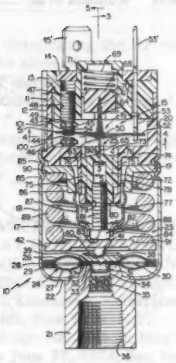
B 428,877
FLUID OPERATED ELECTRICAL SWITCH CONSTRUCTION

Werner R. Bauer, Radnor, Pa., and Roger P. Sepso, Stratford, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 27, 1973, Ser. No. 428,877
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—83 SA **7 Claims**

References Cited
UNITED STATES PATENTS

2,716,395	8/1955	Pettigrew et al.	121/45
2,807,686	9/1967	Clendenin	200/83
3,133,171	5/1964	Griffith	200/83
3,444,341	5/1969	Mighton	200/82



1. A fluid operated electrical switch construction comprising a first housing having an electrical switch therein, a second housing having an expandible and contractible fluid operated element therein, said housings being secured together, and motion transmitting means disposed in said housings between said element and said switch to transmit movement of said element to said switch to operate the same, said motion transmitting means having length adjustment means therein, said adjustment means comprising a pair of cooperating threaded members which thread axially of each other along a longitudinal axis that extends between said electrical switch and said fluid operated element, one of said housings carrying said threaded members, the other of said housings having means for holding one of said members to prevent the same from turning relative to said other housing.

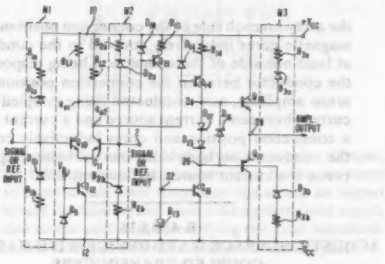
B 439,542
RADIATION RESPONSIVE VOLTAGE DIVIDING CIRCUIT

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,542
Int. Cl.[2] H03F *3/08*
U.S. Cl. 330—33 **9 Claims**

References Cited
UNITED STATES PATENTS

3,619,799	11/1971	Oelke	330/33



1. In a circuit having a circuit node to which is coupled a reverse-biased semiconductor junction which passes a leakage current when subjected to incident radiation, means for clamping said node to a predetermined voltage at radiation levels higher than some predetermined level including:

first and second terminals for the application therebetween of an operating potential;

first and second impedances;

first and second radiation responsive elements, said elements being of the type which in the absence of radiation have a high equivalent impedance which decreases in response to radiation;

means connecting said first impedance in series with said first element between said first terminal and said circuit node; and

means connecting said second impedance in series with said second element between said second terminal and said circuit node.

B 443,712
CORE MEMORY WITH IMPROVED SENSE-INHIBIT RECOVERY TIME

Rex John Crookshanks, Palos Verdes Estates, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 19, 1974, Ser. No. 443,712
Int. Cl.[2] G11C *7/02, 11/06*
U.S. Cl. 340—174 DC **24 Claims**

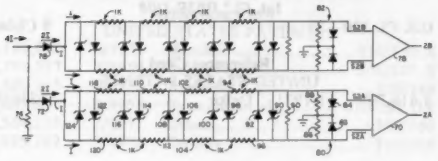
References Cited
UNITED STATES PATENTS

3,548,391	12/1970	Perlman	340/174 CR
3,675,224	7/1972	Ninomiya et al.	340/174 DA
3,774,181	11/1973	Wells et al.	340/174 AC
3,824,569	7/1974	Schuur	340/174 DC

1. A magnetic core memory comprising at least one array of magnetic cores;

a plurality of conductors inductively coupled for selectively switching cores in the array and for sensing output voltage signals generated by selectively switched cores;

a sense amplifier coupled to at least one of said conductors to sense output voltage signals generated thereon by selectively switched cores; and

a non-linear electrical circuit connected to the at least one conductor to modify electric signals appearing thereon, said electrical circuit being connected to the one conductor at a position intermediate the array with the one conductor being inductively coupled to magnetic cores of

the array on each side of the connection position and with magnetic cores inductively coupled to the conductor on at least one side of the connection being disposed along the conductor between the connection position and the sense amplifier, said conductor being coupled to carry current between a current source and a current sink with a connection position and cores inductively coupled to the conductor on both sides thereof being disposed between the current source and current sink.

B 453,616

ACOUSTIC SURFACE WAVE DEVICE WITH HARMONIC COUPLED TRANSDUCERS

Sheldon J. Kerbel, Merrick, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,616

Int. Cl.² H03H *9/26, 9/30, 9/32;* **H01L** *41/08*

U.S. Cl. 333—30 R **7 Claims**

References Cited

UNITED STATES PATENTS

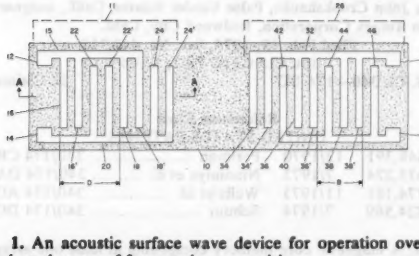
3,376,572	4/1968	Mayo	333/72 X
3,614,463	10/1971	Slobodnik, Jr.	333/30 R
3,727,155	4/1973	De Vries	333/72
3,742,396	6/1973	Bahr et al.	333/30 R

OTHER PUBLICATIONS

Kuhn— "Enhanced Harmonic Response of an Interdigital Surface Acoustic Wave Transducer" in IEEE Trans. Electron Devices, June 1971, p. 395.

White et al.— "Direct Piezoelectric Coupling to Surface Electric Waves" in Applied Physic Letters, Vol. 7, No. 12, Dec. 15, 1965, p. 314–316.

Engan— "Excitation of Elastic Surface Waves by Spatial Harmonics of Interdigital Transducers" in IEEE Trans. on Electron Devices, Vol. ED16, No. 12, Dec. 1969; pp. 1014–1017.



1. An acoustic surface wave device for operation over a selected range of frequencies, comprising:

a piezoelectric substrate;

a first surface wave transducer having a first selected fundamental periodicity and having a first set of harmonic responses, only one of which lies substantially within said selected range of frequencies;

and a second surface wave transducer having a second selected fundamental periodicity, differing from said first selected fundamental periodicity, and having a second set of harmonic responses, only one of which overlaps substantially with any of the harmonic responses of said first transducer, said overlap occurring within said selected range of frequencies.

B 461,874

METHOD OF COPYING MAGNETIC RECORDINGS PROVIDED ON A MAGNETISABLE MEDIUM HAVING A GREATER COERCIVE FORCE BEFORE THAN AFTER RECORDING

Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 297,716, Oct. 16, 1972. This application Apr. 18, 1974, Ser. No. 461,874

Claims priority, application Netherlands, Oct. 21, 1971, 7114533

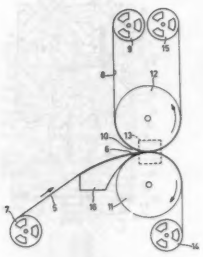
Int. Cl.² G11B *5/86*

U.S. Cl. 360—17 **2 Claims**

References Cited

UNITED STATES PATENTS

2,738,383	3/1956	Herr et al.	360/17
3,465,105	9/1969	Kumada et al.	360/17



1. A method of copying magnetic recordings provided onto a first magnetisable recording medium on a second magnetisable recording medium comprising the steps of recording on the first magnetisable medium while in a state of reduced coercivity, thereafter increasing the coercive force of the first magnetisable medium to a value, H_{c_1}, said first medium consists of a magnetic material having the general formula M_5R, wherein M is at least one transfer metal of the first long period and R is at least one rare earth metal, said medium, before providing the recordings to be copied on it, being subjected to hydrogen gas under pressure to reduce the coercive force thereof, the hydrogen gas pressure being removed before copying is carried out to increase the coercive force of said first magnetizable medium, contacting the magnetic surfaces of the first magnetisable medium in a state of higher coercivity with the recording thereon and of the second magnetisable medium with each other, subjecting said magnetizable mediums while the surfaces thereof are in contact with one another to a magnetic auxiliary field to form on the second magnetizable medium a duplicate of the recording on the first magnetizable medium, and then separating said magnetizable mediums from each other, the coercive force H_{c_1}, the coercive force H_{c_2} of the second magnetisable medium and the field strength H of the magnetic auxiliary field fulfilling the requirement: $aH_{c_2} < H < H_{c_1}/a$ with $1 < a < 2$.

B 465,393

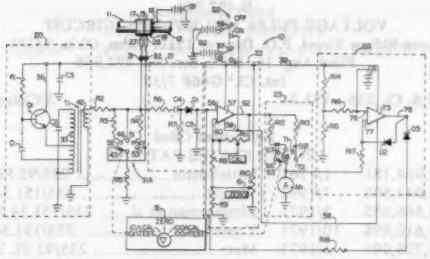
METHOD AND APPARATUS FOR DETERMINING RESISTANCE AT RADIO FREQUENCIES

Charles A. Kirkien, and Charles F. Rhodes, Jr., both of Richardson, Tex., assignors to Sun Oil Company, Dallas, Tex.

Filed Apr. 29, 1974, Ser. No. 465,393
Int. Cl.² G01R 27/02
U.S. Cl. 324—62 13 Claims

References Cited
UNITED STATES PATENTS

2,871,446	1/1959	Wann	324/62 X
3,163,817	12/1964	Simpson	324/52
3,750,016	7/1973	Oakley	324/62 X
3,769,576	10/1973	Norkaitis	324/62 X



1. A method of determining the RF value of a resistance which comprises the steps of:

generating an RF signal;

impressing a portion of said RF signal through the resistance; and

converting the remainder of the RF signal to a direct current having a magnitude linearly related to the resistance.

B 483,615

CIRCUIT ARRANGEMENT FOR GENERATING IN A PICTURE DISPLAY DEVICE A SAWTOOTH CURRENT OF LINE FREQUENCY HAVING AN AMPLITUDE VARYING AT FIELD FREQUENCY

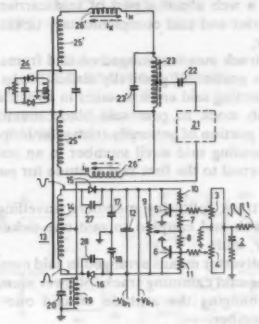
Antonius Boekhorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 40,830, May 27, 1970. This application June 27, 1974, Ser. No. 483,615
Claims priority, application Netherlands, May 29, 1969, 6908229
Int. Cl.² H01J 29/56
U.S. Cl. 315—371 10 Claims

References Cited
UNITED STATES PATENTS

2,649,555	8/1953	Lockhart	315/371
3,320,469	5/1967	Slavik	315/371
3,440,483	4/1969	Kaashoek et al.	315/13

1. A circuit arrangement for generating in a picture display device a sawtooth deflection correction current of line frequency having an amplitude varying at field frequency, said circuit comprising a line deflection current generator and a field deflection current generator for applying sawtooth currents of line and field frequency and having a substantially constant peak-to-peak amplitude to line and field deflection coils respectively. a modulator means controlled by the field deflection generator for obtaining the amplitude variation of field frequency of the sawtooth correction current of line frequency, the said sawtooth correction current of line frequency being a function of the instantaneous value of the line deflection current and of the field deflection current, said modulator including an electronic switch switching at the line frequency, an inductive circuit including said line deflection coil, said switch coupling said field generator to said inductive circuit during the line scan period, a capacitor, a resonant circuit comprising said capacitor and said inductive circuit during the line flyback period, the period of the resonant frequency of the resonant circuit being substantially twice the line flyback period, said electronic switch comprising two



oppositely poled diodes that also generate supply voltages, said circuit further comprising an amplifier having an input adapted to receive said field frequency signal and an output coupled to said modulator, and means for applying said supply voltages due to the said diodes rectifying the peak amplitude during the line scan period of line pulses to said amplifier.

B 484,365

TICKET INFORMATION RECORDING AND WEB PARTING MECHANISM

George Edmund Price, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,365
Int. Cl.² G11B 5/00
U.S. Cl. 360—1 8 Claims

References Cited
UNITED STATES PATENTS

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3,601,042	8/1971	Hamisch	101/69
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3,668,962	6/1972	Chapman	83/337 X
3,668,963	6/1972	Davis	83/346
3,685,760	8/1972	Fedor	242/68.7 X
3,704,820	12/1972	Frederick et al.	226/34
3,745,863	7/1973	Murre et al.	83/224
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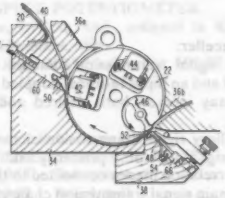

1. A ticket information recording and parting mechanism for producing individual tickets from web ticket stock without waste, comprising

a frame structure,

a continuously rotating carrier arranged on said frame structure and carrying,

an information recording member arranged within said carrier, and

one ticket parting anvil member rotatably mounted within said carrier,

a complementary ticket parting blade member arranged on said frame structure,

a web advancing arrangement on said frame structure for passing a web about a part of said carrier and between said carrier and said complementary ticket parting blade member,

camming track means arranged on said frame structure and having a portion of generally circular loop configuration for presenting said anvil member in an attitude permitting said web stock to pass said blade member intact and another portion of generally triangular loop configuration for presenting said anvil member in an attitude substantially normal to the first said attitude for parting said web stock,

camming track following members travelling in said camming track and coupled to said one ticket parting anvil member, and

camming diverter means arranged in said camming track for engaging said camming track follower members for selectively changing the attitude of said one ticket parting anvil member.

B 488,395

SIDELOBE CANCELLER WITH PROGRAMMABLE CORRELATION SIGNAL WEIGHTING

Hendrick H. Soule, Jr., Marcellus, and John F. Jureller, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed July 15, 1974, Ser. No. 488,395
Int. Cl.² G01S *3/06*
U.S. Cl. 343—100 LE **8 Claims**

References Cited
UNITED STATES PATENTS

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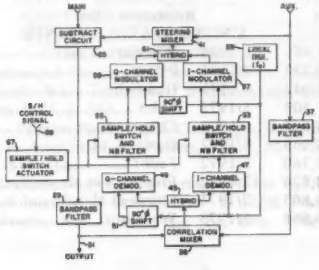

1. In a canceller:

a. a main signal transmission channel having an output terminal and an input terminal coupled to receive a signal which may include both desired and undesired signal content;

b. an auxiliary signal transmission channel coupled to receive a signal including primarily said undesired signal;

c. cross correlation means connected to the output terminal of said main signal transmission channel and to said auxiliary signal transmission channel for detecting the relative amplitude and phase of said main and auxiliary channel signals and generating a correlation signal indicative of the result of such correlation;

d. correlation signal processing means including narrowband filter means and switch means connected in series relation, said switch means being selectively operable to pass the correlation signal generated by said cross correlation means;

e. a compensating cross feed network coupled to said auxiliary signal transmission channel to receive said undesired signal and to said correlation signal processing means to receive the correlation signal as processed thereby, said cross feed network being responsive to the signals coupled thereto to generate a correction signal of amplitude and phase corresponding to the undesired signal content of the main signal transmission channel; and

f. means interposed between said main channel input and output terminals for subtracting said correction signal from said main channel signal thereby to reduce the undesired signal content thereof.

B 492,946

VOLTAGE PULSE MULTIPLYING CIRCUIT

Leon Sidney Siegel, P.O. Drawer 1710, Tulsa, Okla. 74101

Filed Aug. 16, 1974, Ser. No. 492,946
Int. Cl.² G06F *7/38*
U.S. Cl. 235—151.34 **3 Claims**

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UNITED STATES PATENTS

2,968,181	1/1961	Mittelmann	235/92 FL
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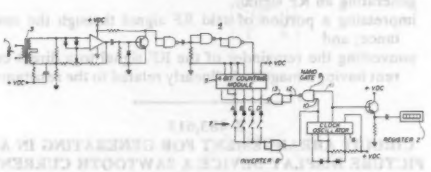
3,777,935	12/1973	Storey	235/151.34 X
3,780,579	12/1973	Barnard	235/92 FL X



1. An electric network which multiplies voltage pulses; including,

a meter responsive to a flowing quantity of material by generating voltage pulses at a frequency proportional to the flow rate of the material,

a circuit section connected to the meter and responsive to the voltage pulses to establish a series of voltage pulses having a consistent height and width,

a binary counter connected to the circuit section to receive the voltage pulses and having manually setable output switches,

an inverter circuit connected to the output switches of the binary counter,

a clock oscillator connected to the inverter to receive the signal from the inverter as an input,

a register connected to the clock oscillator output,

and a NAND gate connected to the clock output as a unit in a feedback circuit to the binary counter and connected to the inverter for control of the function of the NAND gate in the feedback circuit,

whereby the counter has its output reset to a logic 0 level by each voltage pulse received from the circuit section and the inverter establishes a logic 1 level when it receives the logic 0 level from the counter switches to turn the clock on to establish its output voltage pulses at a predetermined frequency to the register during the time the logic 1 level is received as an input and the NAND gate receives the logic 1 level and is thereby uninhibited to allow the feedback circuit to transmit the clock pulses to the counter until the number of pulses established by the output switch setting is reached which re-establishes

the logic 0 level to turn the clock off and inhibit the NAND gate to block the feedback circuit.

B 499,718

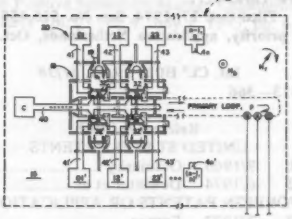
MULTIPLE LOOP SHIFT REGISTER HAVING REDUNDANCY

John L. Archer, Orange; Thomas T. Chen, Yorba Linda, and Leonard R. Tocci, Laguna Niguel, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 22, 1974, Ser. No. 499,718
Int. Cl.² G11C *29/00, 11/14, 19/00*
U.S. Cl. 340—174 TF **11 Claims**

References Cited
UNITED STATES PATENTS

3,792,450	2/1974	Bogar et al.	340/174 TF



1. A serial shift register comprising,

a layer of magnetic material wherein single wall magnetic domains can be propagated,

a propagation loop defined by magnetic poles formed sequentially in a magnetically soft, patterned overlay on the magnetic layer in the presence of a cyclically varying, in-plane magnetic field,

at least one secondary propagation loop having ends for bubble domain entry and exit at points separated by at least one intervening magnetic pole of said propagation loop and defined by magnetic poles formed sequentially in said overlay in the presence of said cyclically varying in-plane magnetic field,

said secondary propagation loop having a pair of first magnetic poles at said entry and exit, and having at least a second magnetic pole adjacent said entry; and

a conductor network connected to said overlay for applying electric current to portions of said overlay to selectively degrade the magnetic properties thereof and thereby eliminate selected ones of said intervening magnetic poles and said second magnetic poles in order to provide a single continuous propagation path.

B 500,981

ION AND ELECTRON DETECTOR FOR USE IN AN ICR SPECTROMETER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Wesley T. Huntress, Sierra Madre, Calif.

Filed Aug. 27, 1974, Ser. No. 500,981
Int. Cl.² H01J *39/46*
U.S. Cl. 250—291 **18 Claims**

References Cited
UNITED STATES PATENTS

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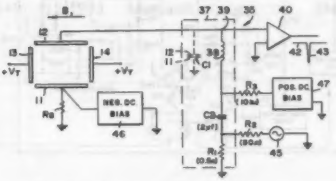
3,484,602	12/1965	McIlraith	250/290
3,511,986	5/1970	Llewellyn	250/292



1. A detector for use in an ion cyclotron resonance (ICR) spectrometer of the type including a resonance cell through which ions move, the cell including first and second parallel resonance plates spaced apart along a first axis, and first and second parallel trapping plates, spaced apart along a second axis perpendicular to said first axis, said spectrometer including means for applying a magnetic field in the direction of said second axis, and means for applying a preselected potential between each of said trapping plates and a reference potential, the detector comprising:

a coil;

means connecting said coil substantially across said first and second resonance plates, the latter defining a capacitive element which together with said coil form a tuned circuit;

an external radio frequency (rf) oscillator adapted to provide signals at frequencies up to the megahertz range, at relatively low adjustable (rf) voltage levels which are independent of the signals' frequencies;

injecting means for connecting said oscillator to said tuned circuit to inject signals at a selected level and frequency from said oscillator into said tuned circuit; and

means for sensing the level of the signals across said tuned circuit.

B 502,973

TIME-RATIO CONTROL HAVING BIDIRECTIONAL SPEED POTENTIOMETER

Michael H. Grace, Griffith, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

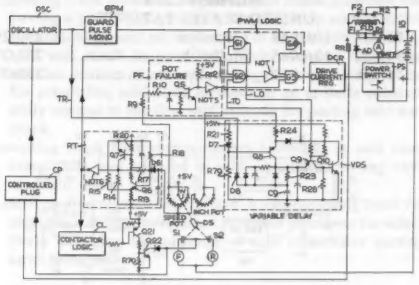
Filed Sept. 3, 1974, Ser. No. 502,973
Int. Cl.² H02P *7/08*
U.S. Cl. 318—257 **1 Claim**

References Cited
UNITED STATES PATENTS

3,209,227	9/1965	Berman et al.	318/257
3,349,309	10/1967	Dannettell	318/341
3,683,253	8/1972	Rummel et al.	318/341 X
3,684,945	8/1972	Hermansson et al.	318/257 X
3,713,009	1/1973	Poppinger et al.	318/257 X

1. In a vehicle driven by a d.c. traction motor energized by unidirectional pulses of current supplied from a battery through a semiconductor power switch and having forward

and reverse contactors which control the direction of said motor to propel said vehicle in the forward and reverse directions respectively, a time-ratio control for selectively varying the duty cycle of said pulses to thereby regulate the speed of said motor including a variable delay RC timing circuit having a timing capacitor in series with a bidirectional speed potentiometer, said speed potentiometer having a resistance element provided with a midtap and a movable wiper adapted to slidably engage said resistance element to vary the resistance of



said speed potentiometer in series with said timing capacitor and thereby regulate the time duration and duty cycle of said pulses, said RC timing circuit being in series with the resistance of said speed potentiometer between said wiper and said midtap, whereby movement of said wiper in either direction from said midtap increases the resistance in said timing circuit and thereby varies the time duration of said pulses, and direction control means for completing respective energizing circuits to said forward and reverse contactors when said wiper is moved in opposite directions away from said midtap.

B 507,647

BIPOLAR A/D CONVERTER

Glenn C. Waehner, Riverside, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 19, 1974, Ser. No. 507,647
Int. Cl.² H03K *13/06*
U.S. Cl. 340—347 AD **3 Claims**

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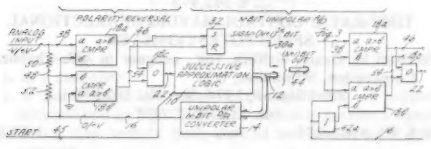
UNITED STATES PATENTS

3,505,668	4/1970	Ottesen	340/347 AD
3,544,993	12/1970	Gabriel	340/347 AD
3,657,653	4/1972	Wilkinson	340/347 AD
3,718,923	2/1973	Horwitz et al.	340/347 NT



1. Bipolar analog to digital conversion apparatus for providing a digital manifestation of an analog input signal, comprising:

successive approximation logic means for providing a digital output signal manifestation, said means responsive to an incrementing input signal to increment the digital value at its output;

digital to analog conversion means responsive to the output of said successive approximation logic means for providing an output signal which comprises an analog manifestation of the value of the digital output of said successive approximation logic;

first comparator means, responsive to the analog input signal and to the output of said digital to analog conversion means, for providing a first output signal indicative of the analog input signal being of the same polarity as and greater in magnitude than the output of said digital to analog conversion means;

means for summing the input signal and the output of said digital to analog conversion means to provide a sum-signal manifestation of said signals;

second comparator means, responsive to said sum signal and a reference potential, for providing a second output signal when said sum signal has a polarity with respect to said reference potential which is opposite to that of the output of said digital to analog conversion means; and

means responsive to both of said comparator means for providing said incrementing signal input to said successive approximation logic means.

B 515,455

CAMERA TUBE HAVING A TARGET WITH HETEROJUNCTION

Jan Dieleman, and Arthur Marie Eugene Hoeberechts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,455
Claims priority, application Netherlands, Oct. 27, 1973, 7314804
Int. Cl.² H01J *29/45, 31/38*
U.S. Cl. 313—366 **13 Claims**

References Cited
UNITED STATES PATENTS

3,271,591	9/1966	Ovshinsky	357/2 X
3,821,662	6/1974	Dewinter et al.	357/61 X

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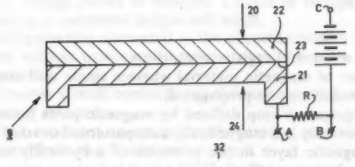
2,097,370	3/1972	France	313/366



1. A camera tube comprising an evacuated envelope and within the envelope an electron source, a target to be scanned by an electron beam emerging from said source, said target comprising a radiation-receiving silicon layer which on the side to be scanned by the electron beam has a chalcogen-containing layer which forms a hetero junction with the silicon layer, said chalcogen-containing layer comprising gallium.

B 520,924

ACOUSTOELECTRIC WAVE SEMICONDUCTOR SIGNAL PROCESSING APPARATUS WITH STORAGE OF WEIGHTING FACTOR

Larry Allen Coldren, Leonardo, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 5, 1974, Ser. No. 520,924
Int. Cl.² G06G 7/19; H03H 9/24
U.S. Cl. 235—181 11 Claims

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3,816,753	6/1974	Kino	235/181
3,826,865	7/1974	Quate et al.	178/7.1
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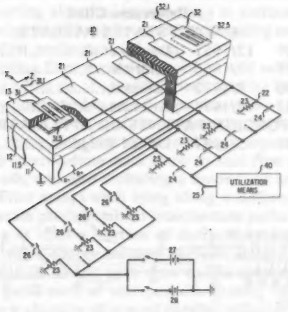
Hayakawa et al.: Storage of Acoustic Signals in Surface States in Silicon, Appl. Physics Letters Vol. 25 No. 4 Aug. 15, 1974.

Stern et al.: New Adaptive Signal Processing Concept, Electronics Letters Mar. 7, 1974 Vol. 10 No. 5.

Coldren: Zinc–Oxide–on–Silicon Acoustically Scanned Imager with Positive Sensitivity Storage Capabilities, Applied Physics Letters Vol. 27 No. 1, July 1, 1975, pp. 6–8.



7. Apparatus according to claim 6 in which the electrodes are essentially buried layer semiconductor stripes in the body, said stripes being of relatively high conductivity compared to the bulk of the semiconductor body.

B 522,577

OPTICAL FIBER POWER TAPS

James Emanuel Goell, Roanoke SW, Va.; Tingye Li, Rumson, and Willis Martin Muska, Little Silver, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 11, 1974, Ser. No. 522,577
Int. Cl.² G02B 5/14
U.S. Cl. 250—227 6 Claims

References Cited
UNITED STATES PATENTS

3,045,223	7/1962	Kapany et al.	250/227 X
3,058,021	10/1962	Dunn	250/227 X
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3,508,589	4/1970	Derick et al.	350/96 B X
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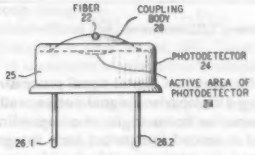

1. An arrangement for tapping optical power from an intermediate portion of an optical fiber waveguide without requiring that the fiber be terminated or broken, said fiber including a guiding region in which the optical power is essentially confined, and including a medium surrounding said guiding region, said arrangement being characterized by:

a body of dielectric material disposed in a coupling relationship to an intermediate length of said fiber, said body having an index of refraction which is approximately equal to or greater than the index of refraction of the medium surrounding said guiding region of said fiber and is selected to couple only a minor portion of the optical power propagating in said fiber waveguide guiding region toward a surface of said dielectric body laterally offset from said guiding region;

a photodetector contacting said laterally offset surface of said dielectric body and including an active area responsive to the wavelength of the optical signal to be propagated through said fiber, said active area of said photodetector being oriented to intercept the optical power coupled out of said guiding region of said fiber by said dielectric body; and

in which said guiding region of said fiber comprises an inner core formed of a low optical loss material, said medium surrounding the guiding region comprising an outer cladding of lower refractive index than that of said inner core; and

said dielectric body has an index of refraction greater than about 0.8 times the index of refraction of said outer cladding of said fiber.

B 526,106
DIGITAL SIGNAL PROCESSING ARRANGEMENT USING A CASCADED INGEGRATOR FUNCTION GENERATOR

Donald Lars Duttweiler, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 22, 1974, Ser. No. 526,106
Int. Cl.² H03K 13/20
U.S. Cl. 340—347 AD 9 Claims

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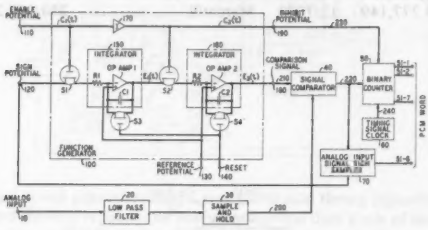


1. In combination in a digital signal processing arrangement for producing a comparison signal corresponding to a predetermined piecewise linear segment companding law:

a first and a second integrator, each integrator having an input and an output terminal and generating a ramp signal;

a sign potential terminal;

means for connecting said sign potential terminal to said input terminal of said first integrator;

means for connecting said output terminal of said first integrator to said input terminal of said second integrator; and

means for operating said first integrator substantially complemental to said second integrator to produce a piecewise linear segment signal.

B 533,734
DC-TO-DC CONVERTERS EMPLOYING STAGGERED-PHASE POWER SWITCHES WITH TWO-LOOP CONTROL

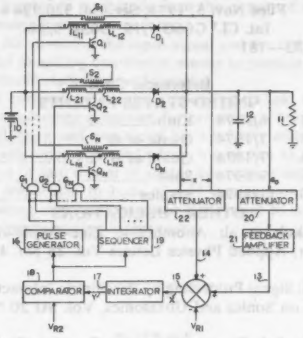
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Gene W. Wester, Pasadena, Calif.

Filed Dec. 17, 1974, Ser. No. 533,734
Int. Cl.² H02M 3/335; G05F 1/64
U.S. Cl. 321—2 10 Claims

References Cited
UNITED STATES PATENTS

3,521,150	7/1970	Bates	323/25 X
3,571,697	3/1971	Phillips	323/17
3,619,758	11/1971	Deranian	321/2
3,621,371	11/1971	Brumm	323/17
3,736,496	5/1973	Lachocki	323/25 X

1. In a boost, buck and buck-boost dc-to-dc converter employing a plurality of parallel staggered-phase power switches with a two-loop feedback control circuit for regulating the voltage of power applied to a load from a source, a separate switched inductive means for coupling said source to said loading during successive phases, a separate sense winding coupled to each inductive means, all of said sense windings being connected in series to one of two feedback loops in said two-loop feedback control circuit to provide a signal that indicates when one of said inductive means is switched on, means responsive to said two-loop feedback control circuit for



producing switching pulses to switch on an inductive means during each successive phase, and means for distributing said switching pulses to said inductive means in sequence during successive phases.

B 534,443
METAL HALIDE HIGH-INTENSITY DISCHARGE LAMP HAVING IMPROVED RESTART CAPABILITY

Robert D. Downing, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,443
Int. Cl.² H01J 61/52
U.S. Cl. 313—42 6 Claims

References Cited
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3,685,880	8/1972	Sobieski	316/19
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FOREIGN PATENTS OR APPLICATIONS

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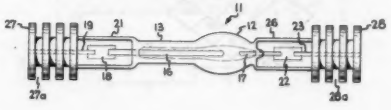

1. A metal halide high-intensity discharge lamp comprising an envelope and at least one electrode structure sealed therein, said electrode structure comprising an elongated refractory metal electrode extending with said envelope and a conductor extending externally of the envelope, said envelope having a gas fill including a halide, the inner end of said electrode becoming molten during lamp operation, and a heat radiator connected to said conductor externally of said envelope for radiating heat into surrounding air so as to aid the cooling of said electrode upon termination of the discharge without substantially affecting the operating temperature of said electrode.

B 534,991

SURFACE ACOUSTIC WAVE MULTI-CHANNEL FILTER

Rolf D. Weglein, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1974, Ser. No. 534,991
Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/08
U.S. Cl. 333—72 7 Claims

References Cited
UNITED STATES PATENTS

3,568,102	3/1971	Tseng	333/30 R
3,753,164	8/1973	DeVries	333/30 R

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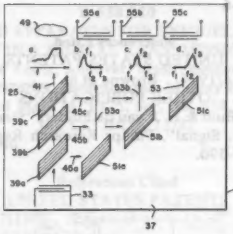


1. A surface acoustic wave multi-channel filter, comprising:

a substrate having a surface capable of supporting propagating surface acoustic wave energy;

input transducer means disposed on said substrate surface for converting electrical input energy to surface acoustic wave energy in said substrate and propagating said energy along a first predetermined path;

periodic grating filter means disposed on said substrate and including a first set of spaced periodic grating filter arrays tandemly positioned in said first predetermined path each for reflecting a portion of the propagating surface acoustic wave energy incident thereon along a separate predetermined intermediate path skew to said first predetermined path, and also including a second set of periodic grating filter arrays each lying along a different one of said separate predetermined intermediate paths and each reflecting at least a portion of the propagating surface acoustic wave energy incident thereon along a separate predetermined output path skew to the associated intermediate path, each of said periodic grating filter arrays including a plurality of spaced parallel reflector elements having a fixed periodicity, said periodic grating filter arrays in each associated pair of such arrays having the same reflector element periodicity but different from the reflector element periodicity of other associated pairs of such arrays thereby providing a predetermined different frequency-selective characteristic for each said associated pairs of said periodic grating filter arrays; and

output transducer means disposed on said substrate surface and including output transducers each lying along a different one of said predetermined output paths and each converting surface acoustic wave energy incident thereon, as reflected by said associated pairs of said periodic grating filter arrays in said first and second sets, to electrical output energy having a desired different center frequency.

B 536,009

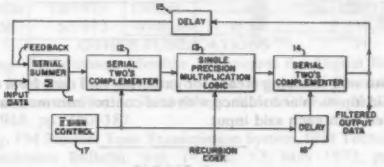
RECURSIVE NUMERICAL PROCESSOR

Fritz H. Schlereth, Baldwinsville, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,009
Int. Cl.² G06F 7/38
U.S. Cl. 235—156 7 Claims

References Cited
UNITED STATES PATENTS

3,609,568	9/1971	Jackson	235/156 X
3,699,326	10/1972	Kindell et al.	235/176 X
3,725,687	4/1973	Heightley	235/164



1. In a recursive processor subject to error integration, the combination comprising:

a. input terminal means for connection to a source of input data representing a time series, said input data being expressed in successive words in two's complement notation,

b. a first two's complementer to which said input data from said input terminal means is coupled for inverting the sign of serial words coupled thereto in two's complement notation in response to a control signal,

c. a numeric sub-processor coupled to the output of said first two's complementer for accepting input data in two's complement notation, said sub-processor being subject to a bias error which is consistently correlated with the sign of the input data,

d. a second two's complementer to which the output of said subprocessor is coupled for inverting the sign of serial words coupled thereto in two's complement notation in response to a control signal, and

e. control means coupled to the control input of said first and second two's complementers to invert and reinvert respectively the sign of alternate words to substantially cancel said bias error without changing the sign of the output data stream.

B 541,496

TRAFFIC USAGE DATA GATHERING APPARATUS

Richard Henry Etra, Forest Hills, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1975, Ser. No. 541,496
Int. Cl.² G06F 1/00
U.S. Cl. 340—172.5 16 Claims

References Cited
UNITED STATES PATENTS

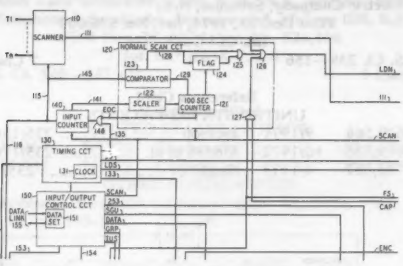
3,099,819	7/1963	Barnes	340/172.5
3,115,549	12/1963	Lamneck et al.	179/8 A
3,196,401	7/1965	Lamneck	340/172.5
3,231,866	1/1966	Goetz et al.	340/172.5
3,546,678	12/1970	Callaway et al.	340/172.5
3,588,837	6/1971	Rash et al.	340/172.5
3,732,547	5/1973	Etra	340/172.5
3,866,185	2/1975	Etra et al.	340/172.5

FOREIGN PATENTS OR APPLICATIONS

1,089,499	11/1967	United Kingdom	179/8 A

1. Apparatus for gathering data pertaining to the status of each of a plurality of inputs comprising, means for scanning

said plurality of inputs in succession, individual means associated with each of said inputs for storing control information associated with each said input, and control means operable



with said scanning means for gathering said data from each of said inputs in accordance with said control information associated with each said input.

B 545,945

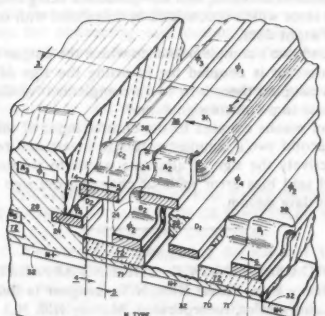
MNOS CHARGE TRANSFER DEVICE MEMORY WITH OFFSET STORAGE LOCATIONS AND RATCHET STRUCTURE

Yum T. Chan, Newport Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 31, 1975, Ser. No. 545,945
Int. Cl.² G11C 11/40, 11/24, 19/28
U.S. Cl. 340—173 R **9 Claims**

References Cited
UNITED STATES PATENTS

3,654,499	4/1972	Smith	340/173 CA
3,863,065	1/1975	Kosonocky et al.	357/24



4. In a permanent charge-storage charge-transfer memory in which charge packets are introduced into the memory by insertion into a charge transfer channel; in which charge packets are propagated along said channel, under the influence of a set of propagation electrodes overlying said channel, until said charge packets located where they are to be permanently stored; and in which the charge packets are permanently stored through electric field dependent transport between the charge transfer material and a permanent storage structure capable of trapping charge thereat, the improvement comprising:

disposing the permanent storage structures in locations laterally displaced from the charge transfer channel to minimize permanent-storage-structure-induced charge transfer inefficiencies in the propagation channel;

means for preventing charge propagated in a forward direction along the channel from spreading into the portion of the charge transfer material underlying the permanent storage structure; and

means for forcing charge propagated in a backward direction along said charge transfer channel to flow into the portion of the charge transfer material underlying the permanent storage structure.

B 546,426

METHODS AND APPARATUS FOR REDUCING THE BANDWIDTH OF A VIDEO SIGNAL

Earl Franklin Brown, Piscataway; Robert Lewis Eilenberger, Colts Neck; Alan Mayer Gordon; Pat Le Mar Gordon, both of Matawan, and John Ormond Limb, New Shrewsbury, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

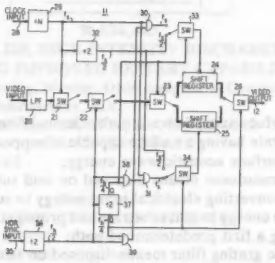
Filed Feb. 3, 1975, Ser. No. 546,426
Int. Cl.² H04N 5/46, 7/18
U.S. Cl. 178—6 **9 Claims**

References Cited
UNITED STATES PATENTS

3,806,644	4/1974	Browne et al.	178/6.8

OTHER PUBLICATIONS

M. C. W. van Buul & L. J. van de Polder, "Standards Conversion of a T.V. Signal", Philips Research Reports, Vol. 28, 8–73, pp. 377–390.



1. Apparatus for reducing the bandwidth of the composite video signal generated by a television camera, or the like, said camera supplying in addition to the video signal a horizontal synchronization signal and a master clock signal, which comprises:

a first divider circuit for dividing the frequency of said horizontal synchronization signal by a factor of two;

a second divider circuit, connected to the output of said first divider circuit, for dividing the frequency thereof by a factor of two, said second divider circuit having first and second complementary outputs;

a third divider circuit for dividing the frequency of said master clock signal by a factor of N, where N is inversely proportional to the horizontal definition desired for the reduced bandwidth video signal;

a fourth divider circuit for dividing the frequency of the output from said third divider circuit by a factor of two;

first switching means, controlled by the output of said first divider circuit, for interrupting the transmission path of said video signal during alternate scanning lines in each field of said vido signal;

a first shift register of a capacity sufficient to store at least one complete scanning line of said video signal;

a second switching means, controlled by the first output of said second divider circuit, for alternately connecting the clock pulse input of said first shift register to the output

of said third divider circuit or to the output of said fourth divider circuit;

a second shift register of a capacity sufficient to store at least one complete scanning line of said video signal;

third switching means, controlled by the second output of said second divider circuit for alternately connecting the clock pulse input of said second shift register to the output of said fourth divider circuit or to the output of said third divider circuit;

fourth switching means, connected to the output of said first switching means and controlled by the first output of said second divider circuit, for alternately routing the scanning lines of said video signal which are passed by said first switching means to said first or to said second shift register; and

fifth switching means controlled by the second output of said divider stage, for alternately selecting the output of said first and said second shift registers thereby to generate a composite video signal of reduced bandwidth.

B 558,220

METHOD AND APPARATUS FOR UNIQUELY ENCODING CHANNELS IN A DIGITAL TRANSMISSION SYSTEM

George Howard Lentz, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1975, Ser. No. 558,220

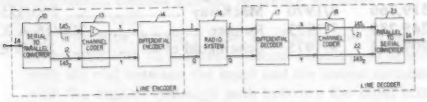
Int. Cl.² H03K *13/32*

U.S. Cl. 325—40 **7 Claims**

References Cited

UNITED STATES PATENTS

3,069,482	7/1963	Frank et al.	325/41
3,128,342	4/1964	Baker	178/66
3,128,343	4/1964	Baker	178/67
3,500,207	3/1970	Ruthroff	325/60
3,646,516	2/1972	Flinders et al.	340/146.1 BE
3,665,395	5/1972	Bochmann	325/41 X
3,665,430	5/1972	Hinrichs et al.	340/146.1 BE



1. In a multichannel digital transmission system of the type wherein: (a) the incoming digital bitstream associated with each channel is divided into frames, each of said frames including a first group of terminal control bits, a group of data bits, and a second group of terminal control bits; (b) *n* such frames define a superframe; and (c) the receiving location includes monitoring means, responsive to said terminal control bits, for marking a channel bad if said terminal control bits indicate an excessive number of parity violations; a line encoder which comprises:

a series-to-parallel converter connected to the source of the incoming bitstream for generating, on two parallel bit rails, first and second bitstreams at half the rate of the incoming bitstream;

an encoder connected to said parallel bit rails for encoding said first and second bitstreams for transmission over said digital transmission system; and

means, located upstream of said encoder, for inverting the sense of at least one of said first and second bitstreams whereby said channel is uniquely coded with respect to a reference channel in the same system in which neither bitstream is inverted.

B 561,764

ANTI-MULTIPATH DIGITAL SIGNAL DETECTOR

John H. Painter, Newport News, Va., assignor to U.S. Government, Washington, D.C.

Continuation of Ser. No. 412,379, Nov. 2, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,764

Int. Cl.² H04L *15/24;* **H04B** *1/10;* **G06F** *15/36*

U.S. Cl. 178—88 **12 Claims**

References Cited

UNITED STATES PATENTS

3,378,847	4/1968	Grover et al.	325/476
3,396,369	8/1968	Brothman et al.	340/146.1 R
3,490,040	1/1970	Choquet et al.	325/320
3,551,816	12/1970	Paine	325/321
3,614,626	10/1971	Dillard	325/323
3,736,507	5/1973	Wolejsza, Jr. et al.	178/67

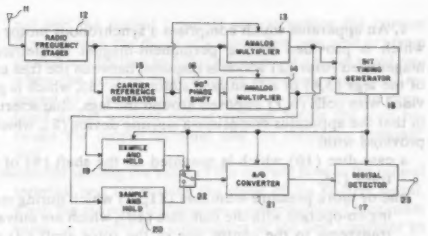
OTHER PUBLICATIONS

Gooding: Performance Monitor Techniques for Digital Receivers Based on Extrapolation of Error Rate, IEEE Transactions on Communication Technology, Vol. COM–16, No. 3, June 1968, pp. 380–387.

Murray: FM Parallel Tone Transmission System, IBM Technical Disclosure Bulletin, Vol. 14, No. 12, May 1972, pp. 3631–3632

Belman et al.: FSK Digital Demodulator with Majority Decision Filtering, IBM Technical Disclosure Bulletin, Vol. 13, No. 4, Sept. 1970, pp. 1042–1043.

Chadwick et al.: The Design of a Low Data Rate MSFK Communication System, IEEE Transactions on Communication Technology, Vol. COM–18, No. 6, Dec. 1970, pp. 740–750.



1. A receiver for radio signals that are modulated with binary information and that have been transmitted through a multipath medium comprising:

means receiving said radio signals for producing two quadrature components of the signals representing said binary information;

means receiving said two quadrature components for generating bit timing signals;

analog-to-digital converter means under the control of said bit timing signals for converting several samples, during each bit period, of said two quadrature components into two sets of digital signals;

two digital computer means, in one-to-one correspondence with the two digits representing said binary information, with each under the control of said bit timing signals and receiving said two sets of digital signals for computing during each bit period the probability that its corresponding digit was transmitted; and

comparator means for comparing the outputs of said two computer means and for producing a signal representing the digit whose probability of transmission was the greatest.

B 561,784
SYNCHRONOUS MOTOR STARTING MEANS

Hendrik Poel, Drachten, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,784

Claims priority, application Netherlands, Apr. 5, 1974, 7404656

Int. Cl.² H02K 7/118

U.S. Cl. 310—41 **4 Claims**

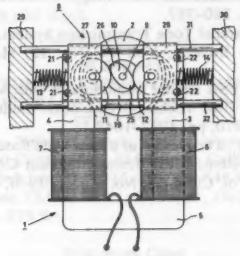
References Cited

UNITED STATES PATENTS

2,078,257	4/1937	Liner	310/41 X
3,333,125	7/1967	Grabow	310/41
3,860,841	1/1975	Jullien-David	310/41

FOREIGN PATENTS OR APPLICATIONS

1,460,560	10/1966	France	310/41
550,809	1/1943	United Kingdom	310/41



1. An apparatus which comprises a synchronous motor (1) which is provided with a permanent-magnet diametrically magentized rotor (2) which is disposed between the free ends of the legs (3,4) of a U-shaped stator core (5), which is provided with coils (6,7) disposed around the legs, characterized in that the apparatus comprises a starting device (8), which is provided with:

a cam disc (10) which is mounted on the shaft (9) of the rotor (2),

one or more pressure members (11,12) which during starting co-operate with the cam disc (10), which are movable transverse to the centre line of the rotor shaft (9) and which are movably connected to stationary parts which are connected to the stator, and

resilient means for loading said pressure members in the direction towards the cam disc (10).

B 563,244
MONO-LOBED SCANNER

William C. Blanchard, and James E. Kreiner, Jr., both of Baltimore, Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 28, 1975, Ser. No. 563,244

Int. Cl.² H01Q 19/16

U.S. Cl. 343—815 **9 Claims**

References Cited

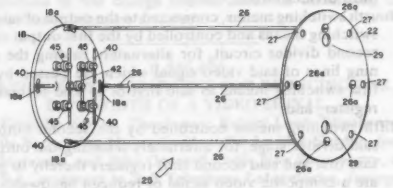
UNITED STATES PATENTS

2,846,678	8/1958	Best	343/840
3,276,022	9/1966	Brunner	343/840
3,386,100	5/1968	Jaszberenyi	343/839
3,680,144	7/1972	Low et al.	343/840

1. Apparatus for correcting the positional inaccuracy of an antenna having a parabolic dish and an antenna element array spaced apart from said parabolic dish and directed into said dish, said antenna element array having at least four antenna elements polarized alike and displaced with orthagonal symmetry about the boresight axis of said antenna comprising:

a ground plane for said antenna elements;

means for fixedly holding said ground plane spaced apart from said parabolic dish and parallel thereto with said four antenna elements displaced with orthagonal symmetry about the boresight axis of said antenna; and,



four elongated electrically conductive elements each having a relatively small cross sectional area arranged about said antenna elements equally spaced radially from said boresight axis and generally parallel thereto and generally equally angularly spaced about one wavelength apart, the spacing being adjustable.

B 579,104
KEYBOARD ASSEMBLY WITH OVERLAPPED FLEXIBLE PRINTED CIRCUIT CABLE SWITCH

Henry William Demler, Jr., 715 E. Maple St., Lebanon, Pa. 17042

Continuation of Ser. No. 503,127, Sept. 4, 1974, abandoned. This application May 20, 1975, Ser. No. 579,104

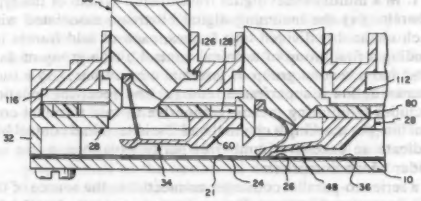
Int. Cl.² H01H 13/70; H05K 1/02

U.S. Cl. 200—5 R **4 Claims**

References Cited

UNITED STATES PATENTS

3,125,895	3/1964	Ross	200/5 C X
3,207,862	9/1965	Robbins	200/50 C X
3,383,487	5/1968	Wiener	200/292 X
3,472,974	10/1969	McGough	200/159 R
3,519,766	7/1970	MacKway	200/325
3,745,288	7/1973	Reimer	200/16 A X
3,909,564	9/1975	Scheingold et al.	200/5 E



1. A keyboard assembly comprising:

a. a flat flexible cable with a portion thereof folded back over on itself and having contacts deposited on both facing surfaces, contacts on one surface being directly across from contacts on the other surface;

b. means for connecting the contacts into electrical circuits;

c. a layer of insulating material positioned between the two contact-carrying surfaces and having holes therethrough, said holes being in registration with opposing contacts;

d. a spring plate, overlying the folded over cable and containing a plurality of resilient first spring members, said members being formed from and integral with the plate, each member comprising a horizontal arm with a vertical arm extending obliquely upwardly and with a pair of spaced, semispherical heads on either side projecting downwardly and positioned adjacent an outside surface of the folded over portion of the cable with each head being in direct alignment with a contact located on the inside surface; and

e. means for depressing the first spring members such that the horizontal arm rotates about its point of attachment with the plate and the semi-spherical heads push on the cable forcing the aligned contacts through the holes in the insulating material and into electrical engagement with the contacts on the facing surface.

B 583,089

SWITCHING VOLTAGE REGULATOR WITH LOW RFI NOISE

Harry L. Maddox, Reynoldsburg, Ohio, assignor to Western Electric Company, Inc., New York, N.Y.

Filed June 2, 1975, Ser. No. 583,089

Int. Cl.² G05F 1/56

U.S. Cl. 323—17 **12 Claims**

References Cited

UNITED STATES PATENTS

3,577,065	5/1971	Putzrath et al.	323/DIG. 1
3,641,424	2/1972	Kuykendall	323/17
3,736,495	5/1973	Calkin et al.	323/DIG. 1
3,742,330	6/1973	Hodges et al.	323/DIG. 1
3,745,444	7/1973	Calkin et al.	323/22 T
3,781,642	9/1973	Dutton	323/DIG. 1

OTHER PUBLICATIONS

Solid State Design Apr. 1963, pp. 30–34, "Considerations in the Design of Switching Type Regulator," by R. D. Loucks.

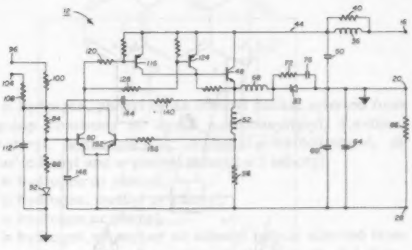
8. In a switching voltage regulator for receiving an unregulated direct current input voltage between an input terminal and a reference terminal thereof and for generating a regulated direct current output voltage across a load between an output terminal thereof and the reference terminal;

an induction coil;

a first transistor, having a base, a collector and an emitter, connected with its emitter-collector circuit path in series with the coil between the input and the output terminals, with the emitter-collector path between the input terminal and the coil;

a diode, connected between the reference terminal and a point between the series connected first transistor and coil, and poled to be nonconductive when the first transistor is conductive;

means for applying a control signal to the base of the first transistor to cyclically drive the first transistor (a) from full conduction to cutoff to interrupt a current flow between the input and the output terminals and through the first transistor and the coil to induce a voltage in the coil of a polarity to forward bias the diode and establish a current path between the reference terminal and the output terminal and through the diode and the coil (b) from cutoff to partial conduction at a controlled rate to again establish the current path between the input terminal and the output terminal and to reduce the current flow through the diode at a controlled rate, and (c) from partial conduction to full conduction at a more rapid rate when the current flow through the diode has been reduced to a predetermined value, to generate the regulated direct current output voltage across the load between the output terminal and the reference terminal, and



means for sensing the value of the current flow to the output terminal and for varying the value of the control signal, when the current flow reaches a predetermined maximum value, to control the conduction of the first transistor to limit the current flow to the output terminal to the predetermined maximum value.

REISSUES

JANUARY 27, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification: matter printed in italics indicates additions made by reissue.

Re. 28,694

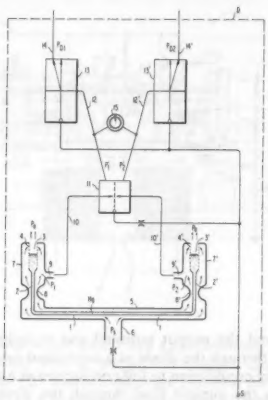
FLUIDIC CLINOMETER CONTROL APPARATUS

Costas E. Markakis, 12 Aravantinou St., Ekali, Athens, and George N. Vamvakoussis, Spiridon Trikoupi 39-41, Athens, Greece

Original No. 3,849,897, dated Nov. 26, 1974, Ser. No. 418,303, Nov. 23, 1973. Application for reissue Feb. 19, 1975, Ser. No. 551,059

Int. Cl.² G01C 9/22

U.S. Cl. 33—365 20 Claims



14. A fluidic clinometer control apparatus comprising a substantially U-shaped tube with its legs terminating in chambers of equal size, which are open to the atmosphere and are formed of microporous material, of a porosity permitting the passage of air, or other similar fluid, therethrough but inhibiting the passage of liquid from within the chambers; a suitable liquid partially filling the tube up to about the middle of the height of the chambers when the leg connecting part of the tube is horizontal and its legs are vertical; a fluidtight enclosure surrounding each of said microporous chambers in spaced relation to said chambers, thus forming an air space therebetween, said air space between said chamber and said enclosure being substantially equal in both legs, each enclosure being provided with a fluid inlet, to be connected to a source of pressurized fluid, and with a fluid outlet; and pressure responsive means connected to said fluid outlets and adapted to control the operation of servomechanisms.

Re. 28,695

MASTER CYLINDER CONSTRUCTION AFFORDING AUTOMATIC RE-PHASING OF MASTER AND SLAVECYLINDERS

Evans Glenn Freese, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Original No. 3,347,043, dated Oct. 17, 1967, Ser. No. 509,113, Nov. 22, 1965. Application for reissue Sept. 9, 1974, Ser. No. 504,179

Int. Cl.² F15B 7/00

U.S. Cl. 60—546 11 Claims

6. A hydraulic actuator assembly comprising:

an elongated cylinder;

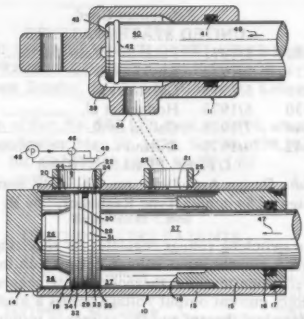
first and second longitudinally spaced fluid inlet and outlet fittings in the cylinder wall;

first and second longitudinally spaced fluid inlet and outlet ports through the cylinder wall communicating respectively with the first and second inlet and outlet fittings;

first and second longitudinally spaced fluid escape orifices through the cylinder wall communicating respectively with the first and second inlet and outlet fittings, one orifice adjacent each of said ports, the longitudinal spacing between the orifices being less than the longitudinal spacing between said ports, and the fittings, ports and orifices being in substantial longitudinal alignment along the cylinder wall;

a piston having limited reciprocable movement in the cylinder; and

an annular seal or packing carried by the piston for sealing between the piston and the internal wall of the cylinder, and for thus dividing the cylinder into first and second fluid pressure chambers,



the location of the piston at each end of its permitted stroke and the spacing between and location of the ports and the orifices being so related, each to the other, that:

(a) when the piston is at one end of its stroke the piston seal is located between the first port and the adjacent first orifice, the first cylinder chamber is in open communication with the first fitting through the first port, and the second cylinder chamber is in restricted communication with the first fitting through said first orifice; and

(b) when the piston is at the other end of its permitted stroke the piston seal is located between the second port and the adjacent second orifice, the second cylinder chamber is in open communication with the second fitting through the second port, and the first cylinder chamber is in restricted communication with the second fitting through the second orifice.

Re. 28,696

PITCH POINT ACTION GEARING

William S. Rouverol, P.O. Box 9122, Berkeley, Calif. 94709

Original No. 3,438,279, dated Apr. 15, 1969, Ser. No. 644,173, June 7, 1967. Application for reissue Mar. 13, 1974, Ser. No. 450,616

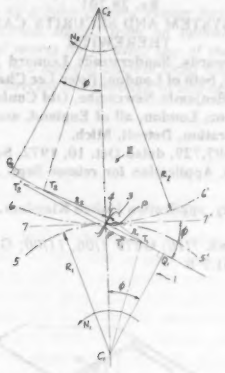
Int. Cl.² F16H 55/14

U.S. Cl. 74—462 7 Claims

1. In a pair of mating gears,

teeth formed to extend across the rims of said gears in a direction slantingly disposed with respect to the pitch line

of said pair to produce at least one area of contact between said pair for all rotational positions of said pair, [said teeth being formed so that the centroid of said area of contact lies substantially on said pitch line for all rotational positions of said gears.] *said teeth having in sections perpendicular to said pitch line active profiles of relative radius of curvature at the pitch lines less than the product of the pitch radii of said pair times the sine of the pressure angle divided by the sum of said pitch radii,*



addendum height of the teeth of one of said pair being greater than 0.5 divided by the normal diametral pitch and the pitch and pressure angle of the teeth are such that when the maximum allowable torque is applied to said gears each said area of contact occupies substantially the full height of the tooth face.

Re. 28,697

Patent Not Issued For This Number

Re. 28,698

ELECTROPHOTOGRAPHIC MATERIAL CONTAINING SENSITIZERS

Yoshinobu Murakami, Higashi-Osaka; Yo Hasegawa, Suita, and Kazuhisa Morimoto, Settsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

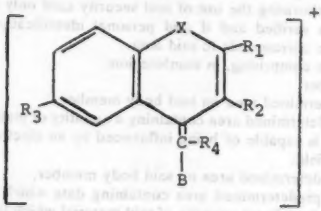
Original No. 3,712,811, dated Jan. 23, 1973, Ser. No. 121,508, Mar. 5, 1971. Application for reissue Aug. 7, 1974, Ser. No. 495,520

Claims priority, application Japan, Mar. 13, 1970, 45-21766; Mar. 13, 1970, 45-21767

Int. Cl.² G03G *5/06*

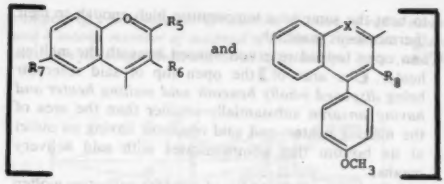
U.S. Cl. 96—1.6 **3 Claims**

1. An electrophotographic material comprising a conductive support layer and photoconductive insulating layer, the latter comprising a combination of a photoconductive polymeric compound and a sensitizing amount of a sensitizer having the following formula:

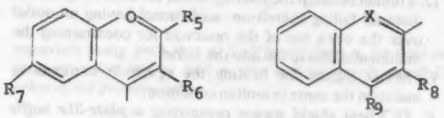


wherein

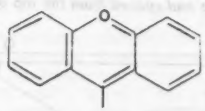
B represents a radical selected from the group consisting of



and



and



R_1 is hydrogen, phenyl or an ethenyl radical selected from the group consisting of styryl, p-methoxystyryl, 3,4-dimethoxy-styryl, α-phenylstyryl, α-phenyl-p-methoxystyryl, β-furyl(α′)ethenyl and α-phenyl-β-furyl(α′) ethenyl;

R_2 is hydrogen or phenyl;

R_3 is hydrogen, methyl or phenyl;

R_4 is hydrogen or phenyl;

R_5 is hydrogen, phenyl or an ethenyl radical selected from the group consisting of styryl, p-methoxystyryl, 3,4-dimethoxy-styryl, α-phenyl-p-methoxystyryl, β-furyl(α′)ethenyl and α-phenyl-β-furyl(α′)ethenyl;

R_6 is hydrogen or phenyl;

R_7 is hydrogen or phenyl;

R_8 is hydrogen or phenyl;

R_9 is hydrogen or p-methoxyphenyl;

the anion is an anionic function selected from the group consisting of perchlorate, fluoroborate, chloroferrate, chlorozincate and nitrate; and

X is oxygen or a sulfur atom;

said photoconductive polymeric compound comprising at least one compound selected from the group consisting of poly-N-vinylcarbazole, brominated poly-N-vinylcarbazole and polyacenaphthylene.

Re. 28,699

HOT MELT MACHINE

Gordon L. Kelling, Minnetonka, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Original No. 3,876,105, dated Apr. 8, 1975, Ser. No. 445,151, Feb. 25, 1974. Application for reissue June 23, 1975, Ser. No. 589,134

Int. Cl. B67d *5/62*; **F27b** *14/06*

10 Claims

U.S. Cl. 222—56 **10 Claims**

1. In hot melt apparatus that comprises a hopper for holding a store of thermoplastic material in a solid state and delivery means for conducting material from the hopper, in molten state, to a point of use at which it is dispensed, hot melt supply means by which the solid material is brought to the molten state at a rate substantially in step with the rate at which molten material is dispensed and by which a substantially constant-volume supply of the molten material is kept available for immediate dispensing, said hot melt supply means comprising:

A. a melting heater extending across an outlet at the bottom of the hopper and arranged to support thermoplastic material in its solid state but to permit molten thermoplastic material to fall;

B. means for electrically energizing the melting heater

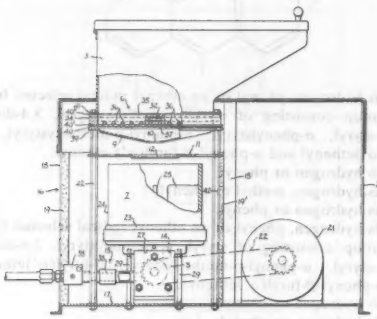
to heat the same to a temperature high enough to melt thermoplastic material;

C. an open topped reservoir spaced beneath the melting heater, [the area of] the open top of said reservoir being *disposed wholly beneath said melting heater and having an area* substantially smaller than the area of the melting heater, and said reservoir having an outlet at its bottom that communicates with said delivery means;

D. a funnel beneath the melting heater for collecting molten material falling therefrom, said funnel having an outlet over the open top of the reservoir for constraining the molten material to fall into the same;

E. heater means for heating the reservoir contents to maintain the same in molten condition;

F. [E] heat shield means *comprising a plate-like baffle located* above *and spaced from* the top of the reservoir



and underlying *and spaced from the bottom of* the funnel, to prevent transmission to the melting heater of heat from the reservoir, said heat shield means having a hole therethrough which is vertically aligned with the outlet of the funnel *and of a size* to allow molten material to drop *directly* into the reservoir from the outlet in the funnel;

G. sensing means in the reservoir at a level spaced from both the top and the bottom thereof, for detecting the presence of molten thermoplastic material at said level in the reservoir; and

H. means operatively connecting said sensing means with said means for electrically energizing the melting heater, to initiate energization of the melting heater whenever molten material in the reservoir is below said level and to terminate such energization when such molten material reaches said level.

Re. 28,700

ANTIBIOTIC X-5108 FOR STIMULATING GROWTH

Julius Berger, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Original No. 3,657,421, dated Apr. 18, 1972, Ser. No. 67,724, Aug. 28, 1970. Continuation of Ser. No. 64,389, Aug. 14, 1970, Pat. No. 3,708,577. Application for reissue Dec. 11, 1972, Ser. No. 313,705

Int. Cl. H61k *21/00*

U.S. Cl. 424—122 **5 Claims**

1. A composition for enhancing the feed efficiency and stimulating the growth of poultry which comprises antibiotic X-5108, a yellow amorphous substance characterized as follows:

(a) analysis: carbon, 63.63%; hydrogen, 7.81%; nitrogen, 3.48%; oxygen, 25.08% (by difference);

(b) soluble in methanol, ethanol, 1- and 2-propanol, tert. butyl alcohol, ethyl acetate, amyl acetate, butyl acetate and chloroform;

(c) a characteristic infrared absorption spectrum as shown in accompanying FIG. 1;

(d) a characteristic nuclear magnetic resonance spectrum as shown in accompanying FIG. 4;

or a pharmaceutically acceptable salt thereof, and a non-toxic inert ingredient, wherein antibiotic X-5108 or a salt thereof is present in a ratio by weight of from about 0.0001 part to about 0.01 part per 100 parts of inert ingredient.

Re. 28,701

DISPENSING SYSTEM AND SECURITY CARD FOR USE THEREWITH

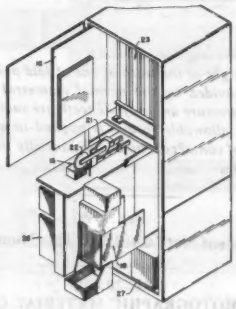
John David Edwards, Sanderstead; Leonard Perkins; John Henry Donald, both of London; Peter Lee Chappell, Doodcrest K I; Sean Benjamin Newcombe, Old Coulsdon, and Malcolm David Roe, London, all of England, assignors to Burroughs Corporation, Detroit, Mich.

Original No. 3,697,729, dated Oct. 10, 1972, Ser. No. 68,650, Sept. 1, 1970. Application for reissue Sept. 30, 1974, Ser. No. 510,522

Claims priority, application United Kingdom, Sept. 9, 1969, 44452/69

Int. Cl.[2] **G06K** *7/10*; **G07F** *1/06, 11/00*; **G06K** *19/06*

U.S. Cl. 235—61.7 B **51 Claims**



1. Apparatus for authenticating a credit or security card and its use in response to the introduction into said apparatus of said security card and the entering into said apparatus of predetermined information, comprising:

means for verifying that a particular security card is valid, said verifying means including an oscillator and a transducer for quantizing a characteristic of magnetic material deposited on discrete areas of said security card, and means for reading encoded information, representative of said characteristic, and data on said security card,

means for permitting a user of said apparatus to enter personal identification information into said apparatus,

means for determining if said personal identification information corresponds to said data, and

means for authorizing the use of said security card only if the card is verified and if said personal identification information corresponds to said data.

11. An article comprising, in combination:

a body member;

a first predetermined area on said body member;

said first predetermined area containing a quantity of material which is capable of being influenced by an electromagnetic field;

a second predetermined area on said body member,

said second predetermined area containing data which is representative of said quantity of said material which lies within certain portions of said first predetermined area on said body member.

Re. 28,702

NONINTERACTING LENS SYSTEM FOR A COLOR ENCODING CAMERA

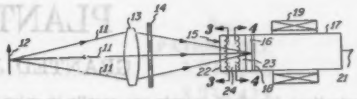
Albert Macovski, Palo Alto, Calif., assignor to RCA Corporation, New York, N.Y.

Original No. 3,641,255, dated Feb. 8, 1972, Ser. No. 29,448, Apr. 17, 1970. Application for reissue Apr. 4, 1973, Ser. No. 347,630

Int. Cl.[2] H04N 9/06; G02B 27/12

U.S. Cl. 358—47 **13 Claims**

12. For use in a color camera system having a device for generating electrical signals from an optical image focused thereon, optical means for focusing one of the primary colors onto the device in a series of discrete strips while passing other primary colors directed therethrough to said device, said means comprising a first member of material of index of refraction n_1 and a second member of material of index of refraction n_2, said members forming a lenticular array of cylindrical lenses, and the



materials being such that n_1 is different from n_2 for said one primary color and n_1 and n_2 are approximately equal for other of the primary colors.

PLANT PATENTS

GRANTED JANUARY 27, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,826

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave.,
Visalia, Calif. 93277

Filed Sept. 30, 1974, Ser. No. 511,021
Int. Cl. A01h 5/00
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by buds and flowers resembling the "Starina" (Plant Pat. No. 2,646) miniature rose in general form and color but with more open (less petals) flowers, the color being similar but of usually a brighter and lighter hue; the general color effect being orange-red; and further characterized by a plant which is of vigorous and compact growth, easy to propagate from cuttings, with medium small semi-glossy foliage, an abundance of bloom, with flowers borne singly or several to the stem in loose spray or cluster.

3,827

AZALEA PLANT

Anthony M. Shammarello, 4508 Monticello Blvd.,
South Euclid, Ohio 44143

Filed Sept. 27, 1974, Ser. No. 510,212
Int. Cl. A01h 5/00
U.S. Cl. Plt.—56 1 Claim

1. A new and distinct variety of azalea plant of the hardy evergreen type, substantially as herein shown and described, characterized particularly as to novelty by the radiant pink color of its semi-double hose-in-hose flowers, by the absence of fading of the flowers when exposed to the sun, by the long lastingness of color of flowers, by the plant forming a compact bush snug to the ground, by the hardiness of the plant and buds at low temperatures inheritant of the parent plants and retaining the good qualities of plant character of parent plants.

PATENTS

GRANTED JANUARY 27, 1976

ERRATA

For CLASS	See PATENT NO.
036–02.5 R	3,934,346
092–052	3,934,423
206–223	3,934,715
214–131 A	3,934,726
239–002 R	3,934,817
239–008	3,934,818
239–189	3,934,819
239–205	3,934,820
239–224	3,934,821
239–226	3,934,822
239–472	3,934,823
239–534	3,934,824
241–016	3,934,825
241–081	3,934,826
241–084	3,934,827
241–102	3,934,828
241–259.1	3,934,829
242–018 DD	3,934,830
242–043	3,934,831
242–054	3,934,832
242–056.9	3,934,833
242–067.1	3,934,834
242–067.2	3,934,835
242–072.1	3,934,836
242–075.5	3,934,837
242–085.1	3,934,838
242–198	3,934,839
242–195	3,934,840
242–198	3,934,841
242–199	3,934,842
244–007 C	3,934,843
244–040 A	3,934,844
244–129 D	3,934,845
244–130	3,934,846
244–137 P	3,934,847
244–151	3,934,848
356–246	3,934,965
346–045	3,935,079
261–037	3,935,156
423–236	3,935,188
424–246	3,935,204
023–289	3,935,225
252–415	3,935,244
428–378	3,935,344
024–150	3,935,355
250–211	3,935,441
240–102 B	3,935,560
357–011	3,935,582

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PATENTS

GRANTED JANUARY 27, 1976

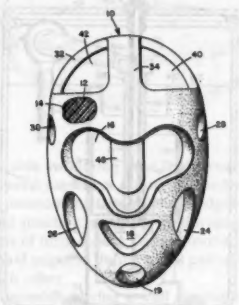
GENERAL AND MECHANICAL

3,934,271

PROTECTIVE HELMET

Jhoon Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207

Filed Nov. 27, 1974, Ser. No. 527,910
Int. Cl.[2] A42B *1/08*
U.S. Cl. 2—3 R **8 Claims**



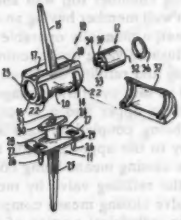
1. A protective helmet adapted to be worn on a person's head and capable of absorbing energy and generally conforming to the shape of a person's head, comprising resilient foam means covered with a tough, pliable surface casing, openings in said helmet generally conforming to the person's ears and chin, one large opening outlining the face portion of the head including the eyes, nose, mouth and chin, the rear of said helmet being generally open and including a flap member adapted to protect the rear of the head and to aid in putting on and taking off of said helmet.

3,934,272

KNEE PROSTHESIS

William Maxwell Wearne; John Edward Harris, and Wilfred Potter, all of Melbourne, Australia, assignors to The University of Melbourne, Melbourne, Australia

Filed Nov. 19, 1974, Ser. No. 525,319
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.911 **5 Claims**



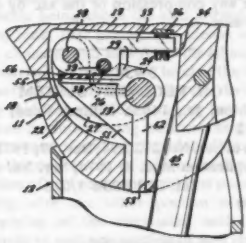
1. A knee prosthesis including a first member having a rod adapted for connection within the marrow cavity of a femur, a second member having a rod extending therefrom adapted for connection within the marrow cavity of a tibia, said first member having a body of generally hollow cylindrical form, a pair of half bearing members having slots formed therein, each of the bearing members being located in one end of the cylindrical body, the second member having an extension entering the hollow cylindrical body of the first member and received between and located by the half bearing members, the said extension comprising at least one cylindrical bearing portion received between the half bearing members and a plate extending outwardly therefrom which is adapted to enter said slots, the second member being rotatable relative to the first member about the vertical axis of said cylindrical bearing portion, the limits of rotation being controlled by the said plate striking the walls of the slots.

3,934,273

PROSTHETIC LIMB WITH WEIGHT-RESPONSIVE JOINT LOCK

La Vaughn L. Mortensen, 10533 San Anselmo, South Gate, Calif. 90280

Filed Jan. 20, 1975, Ser. No. 542,217
Int. Cl.[2] A61F *1/04, 1/08*
U.S. Cl. 3—27 **9 Claims**



8. A pivotable mechanism for a prosthetic limb, comprising:
a first portion with a cavity formed at one end thereof;
a second portion with a well formed at one end to allow said one end of said first portion to pivot freely therein;
an axle fixed to said second portion and disposed across said well;
a pin fixed to said first portion and disposed across said cavity and substantially parallel to said axle;
said axle being disposed to extend also across said cavity;
at least one U-shaped brake band disposed around said axle and within said cavity, with the one end of the brake band remote from said first portion engaging said pin, and
first means are provided for causing said first portion to contact the other end of said brake band to cause the ends thereof to move toward each other whenever said first portion is urged toward said second portion;
second means responsive to the extension action of the second portion to lift said pin so that the ends of the brake band separate although said first portion is being urged toward said second portion.

3,934,274

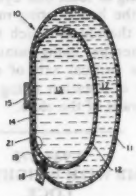
DEFLATABLE MAMMARY AUGMENTATION PROSTHESIS

John H. Hartley, Jr., 2915 Andrews Drive, NW., Atlanta, Ga. 30305

Filed Oct. 29, 1974, Ser. No. 518,399
Int. Cl.[2] A61F *1/00, 1/24*; A41C *3/10*
U.S. Cl. 3—36 **9 Claims**

1. An augmentation prosthesis for subcutaneous implantation beneath the skin of a patient comprising an exterior sac containing an interior capsule which occupies less than the entire volume of the sac, said capsule being fixed to said sac and containing a fixed volume of soft material and said sac

including a discrete one-way valve means for selective addition of a liquid into said sac, said valve means being attached to a wall of said sac and being fixed against movement relative to said wall at its point of attachment thereto, said liquid being compatible with the human body, whereby said augmentation prosthesis may be inserted into a cavity within the human body with substantially no liquid in said sac, liquid may be



introduced into said sac through said valve means while the sac is positioned within the cavity, the cavity may be closed and liquid may be extracted from said sac by piercing the skin of the patient with a hypodermic needle and piercing the sac with the needle and withdrawing a quantity of liquid from said sac to reduce any compression of the sac by contracture of surrounding tissue.

3,934,275

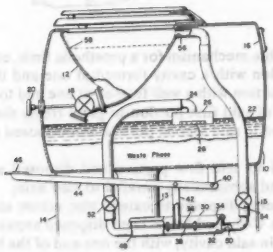
OIL RECOVERY SYSTEM

Norris J. Bishton, Jr., 14636 Hilltree Road, Santa Monica, Calif. 90402

Continuation of Ser. No. 212,594, Dec. 27, 1971, abandoned. This application Mar. 8, 1974, Ser. No. 449,534

Int. Cl.² E03D *5/016*

U.S. Cl. 4—10 **4 Claims**



1. The method of re-using flushing liquid used to flush a recirculating toilet system having a toilet bowl and a waste tank for receiving a mixture of human waste and flushing liquid therein and using a pumping mechanism to operate the flushing mechanism, the flushing liquid having a lower specific gravity than the specific gravity of said waste, said method comprising the steps of:

storing said flushing liquid in said waste tank on top of said waste;

closing a valve means between the toilet bowl discharge and the waste tank;

operating the pumping mechanism until essentially all of said flushing liquid in said tank is pumped directly from said mechanism into said toilet bowl thereby filling said bowl with essentially all of said flushing liquid;

subsequently emptying the waste tank of human waste while retaining essentially all of said flushing liquid in said bowl; and

opening the connection between the toilet bowl discharge and the waste tank to return all of said flushing liquid in said bowl directly to said tank.

3,934,276

FLUSHING CISTERN

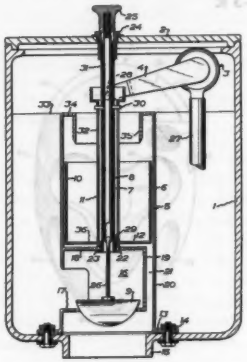
Frans Harry Karlsson, Lund, and Per Torsten Faxen, Bromma, both of Sweden, assignors to Hykon-Patent Aktiebolag, Lund, Sweden

Filed May 21, 1973, Ser. No. 362,570

Claims priority, application Sweden, May 26, 1972, 6906/72

Int. Cl.² E03D *1/36*

U.S. Cl. 4—41 **7 Claims**



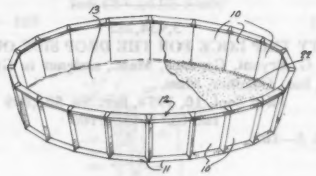
1. A flushing cistern for water closets having a container with a bottom discharge opening, comprising a refilling valve for admitting water into the container, an opening having an outlet valve seat connecting a lower part of the container to the discharge opening, a flushing valve for closing said valve seat, an overflow member providing an overflow passage connecting the discharge opening and an upper portion within the container for limiting the water level in the container to the elevation of said upper portion, said overflow member being an upright tubular member open at its upper end and comprising a lower end portion connected to and tightly surrounding said discharge opening in the bottom of the container, said tubular member having a cylindrical portion and a constricted portion located between said cylindrical portion and said lower end portion, said constricted portion being formed by wall means forming a chamber which constricts the overflow passage in said constricted portion, an opening connecting the chamber to the interior of the container, said wall means comprising chamber top wall and bottom wall members, the bottom wall member having an opening forming said flushing valve seat, a manually operable actuating means for unseating said flushing valve and opening said refilling valve to start a flushing and refilling cycle, a refilling valve closing means mounted in said overflow passage and being movable therein between an upper and a lower position, said valve closing means being coupled to said actuating means and movable thereby to the upper position upon starting of said cycle, said valve closing means being coupled to the refilling valve to close the refilling valve by movement to its lower position, said valve closing means comprising a cup movably positioned in the cylindrical portion of said tubular member above said chamber top wall member to receive water flowing into the overflow member, said cup having a bottom hole which forms at least a part of said overflow passage and through which the cup is emptied to said discharge opening, said valve closing means being positioned and constructed to receive and be weighted by water flowing into the overflow member to move the valve closing means to its lower position thereby closing the refilling valve; said flushing valve, overflow member and cup form an assembly removably mounted on the bottom of said container.

3,934,277

PORTABLE SWIMMING POOL CONSTRUCTION

Richard L. Quirouette, 197 Presland Road, Ottawa, Ontario, Canada (KIK 2B9), and Rejean P. Lemay, 2250 Notre Dame Blvd., Orleans, Ontario, Canada

Filed Apr. 8, 1974, Ser. No. 458,994
Int. Cl.² E04H 3/16, 3/18; F16L 21/02
U.S. Cl. 4—172.19 22 Claims



1. In a portable swimming pool framework having a plurality of sheet metal members arranged side-by-side, a junction assembly for interconnecting adjacent edges of a pair of said members, said junction assembly comprising:

a. a first pair of turned-back flanges formed along respective ones of said edges to define a first pair of slots facing away from each other,

b. a beam member having a wall structure interconnecting a second pair of elongated flanges projecting generally towards each other and then each turned back on itself to define a second pair of slots,

c. said second pair of flanges being located in respective ones of said first pair of slots,

d. and a cleat member having a wall structure interconnecting a third pair of flanges projecting generally towards each other,

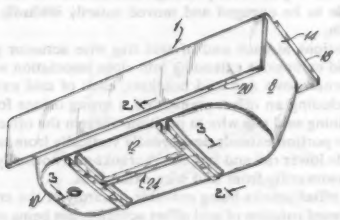
e. said third pair of flanges being located in respective ones of said second pair of slots.

3,934,278

BATHTUB SUPPORT

Donald C. Schrock, Nevada, Mo., assignor to Crane Co., New York, N.Y.

Filed Oct. 11, 1974, Ser. No. 514,277
Int. Cl.² A47K 3/16
U.S. Cl. 4—173 11 Claims



1. A bathtub including:

a. a pair of side walls;

b. a sloping end and an outlet end;

c. a bottom, said bottom, ends and walls forming an integral well;

d. means to support said bottom; and,

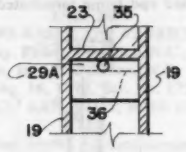
e. water resistant tape positioned between said means and said bottom preventing contact between said means and said bottom to simultaneously secure said means to said bottom and form a sound barrier therebetween.

3,934,279

LIQUID CHEMICAL EVAPORATOR FOR FLUSH TANKS

Sidney Mallin, 236 Kingston Row, Winnipeg, Manitoba, Canada

Filed Apr. 22, 1974, Ser. No. 462,669
Int. Cl.² E03D 9/02
U.S. Cl. 4—228 9 Claims



1. A container for dispensing a deodorizing vapour into the air space of an associated toilet tank, comprising in combination a canister, means for detachable mounting said canister within the associated toilet tank, said canister having an open base which is situated between the normal water level of said tank when installed therein, a baffle spanning said canister to define a chamber therebelow and a liquid deodorizor receiving reservoir thereabove, a closed upper side to said reservoir, said reservoir being situated between said upper side and said baffle, said baffle being above the said normal water level in the associated tank, first passageway means communicating between said chamber and said reservoir adjacent said upper side of said reservoir and above the level of the liquid deodorizor in said reservoir, means in said reservoir dividing same into two portions, said last mentioned means having second passageway means communicating between said portions substantially at the base of said last mentioned means, and opening means in the upper side of said canister communicating with one portion of said reservoir, said first passageway means communicating with the other portion of said reservoir whereby emptying of the associated tank transfers the deodorizor liquid in said one portion of said reservoir to said other portion of said reservoir by differential air pressure so that air is drawn through said opening means, through said second passageway means, bubbles through the liquid in said other portion of said reservoir, through said first passageway means into said chamber, and filling of the associated tank compresses the air in said chamber thereby transferring to said liquid from said other portion of said reservoir to said one portion of said reservoir so that the air in said chamber passes through said first passageway means, through said second passageway means and bubbles through the liquid in said one portion of said reservoir and through said opening means carrying with it an evaporated fraction of said liquid within said reservoir.

3,934,280

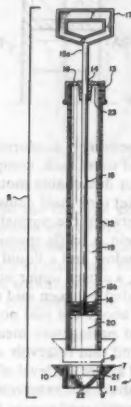
DRAIN-FLUSHING DEVICE

Pier Luigi Tancredi, c/o IASA International, Inc. 972 Lexington Ave., New York, N.Y. 10021

Continuation-in-part of Ser. No. 545,436, Jan. 30, 1975. This application May 21, 1975, Ser. No. 579,316
Int. Cl.³ E03D 11/00
U.S. Cl. 4—255 2 Claims

1. A drain-flushing device comprising in combination: a cylindrical tubular element having an open end at one end thereof and having a conically restricted end at least on inner surfaces thereof at an opposite other end thereof defining an aperture of predetermined small diameter; a reciprocatable sealed disk mounted sealably within the cylindrical tubular element sealably isolating spaces on each of opposite sides of the reciprocatable sealed disk from one another; shaft means mounted within the cylindrical tubular element secured at one end thereof fixedly to the reciprocatable sealed disk and adapted fo reciprocating the reciprocatable sealed disk and extending at an opposite end thereof through and beyond said open end adapted for reciprocation axially within the cylindri-

cal tubular element; a handle element mounted on a distal end of the shaft means at an end opposite from the attached said reciprocatable sealed disk, the handle element being adapted for manual grasping thereof for the pressing on the shaft means in a direction axially of the shaft means to thereby force liquid through the aperture at elevated pressure from one of the spaces adjacent the aperture; the outer surface of said conically restricted end being terminated at an apex of the



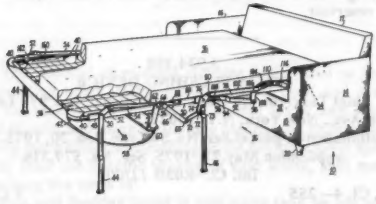
conically restricted end as a structure devoid of further projection ending bluntly at the apex and said inner surfaces being at a conical angle of from about 40 degrees to about 50 degrees relative to the side surfaces of the cylindrical walls of the cylindrical tubular element, the improvement being and including a circumscribing radially-outwardly and upwardly flared flange spaced upwardly from and including a lower cylindrical wall circumscribing the conically restricted end.

3,934,281

MATTRESS COMPRESSION LINKAGE FOR CONVERTIBLE SOFA-BED

Joseph A. Brindisi, Uniondale, N.Y., assignor to Castro Convertible Corporation, New Hyde Park, N.Y.

Filed Oct. 30, 1974, Ser. No. 519,282
Int. Cl.² A47C *17/14*
U.S. Cl. 5—13 **8 Claims**



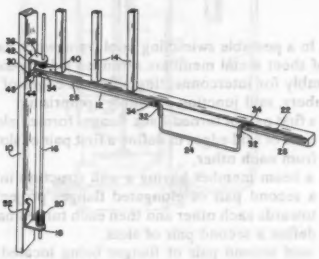
1. In or for a convertible sofa-bed, a folding mechanism for supporting a mattress when unfolded and for supporting a seat when folded, said mechanism having first, second and third sections pivotably connected in series with one another, a mattress compression linkage comprising a first link pivotably connected adjacent one of its ends to said first section at a position separated by a substantial distance from the pivot point between said first and second sections, a second link pivotably connected adjacent one of its ends to said first link adjacent the other end of first link, said second link being pivotably connected adjacent its other end to said third section, abutment means on said third section for engaging said second link when said mechanism is folded and thereby pulling said first link towards said third section to compress the folded over mattress between said first and third sections, a shifting link pivotably connected to said first section, said one end of said first link being pivotably connected to said shifting link, and means for moving said shifting link during folding of the mechanism to move the pivot point of said first link farther from said pivot point between said first and second sections to increase the mattress compression leverage of said linkage.

3,934,282

SAFETY TRIP LOCK FOR THE DROP SIDE OF A CRIB

Robert G. Bryant, Gardner, Mass., assignor to GEM Industries, Inc., Gardner, Mass.

Filed Sept. 10, 1974, Ser. No. 504,809
Int. Cl.² H47C *2100*
U.S. Cl. 5—100 **1 Claim**



1. A safety trip lock for the drop side of a crib wherein said crib includes corner posts, guide rods for said drop side mounted on the corner posts, and a bracket mounted in fixed position on each of two corner posts at opposite ends of the crib at the same side thereof,

each bracket comprising a plate adapted to be secured to its corner post at the inside aspect thereof, a rearwardly extending member on each bracket, each such member having an upwardly and inwardly inclined cam surface and a top edge, there being a notch in each said top edge, said drop side having a lower rail with apertures therein relatively slidably receiving the guide rods,

a trip wire mounted at the inside aspect of said lower rail, said trip wire comprising a generally intermediate offset actuator portion depending from said lower rail in position to be engaged and moved rotarily inwardly of said crib,

extensions at each end of said trip wire actuator portion, said extensions extending into close association with said corner posts and said brackets, each of said extensions including an offset crank, and a spring means for maintaining said trip wire in position wherein the offset actuator portion extends downwardly vertically from said drop side lower rail and said offset cranks also normally extend downwardly from said wire extensions,

said offset cranks being movable inwardly of the crib upon inward rotation of said offset actuator, but being normally held in the notches in the brackets by the weight of the drop side, so that the offset actuator cannot be actuated in the absence of a slight upward motion on the entire drop side releasing the offset cranks from said notches thereby allowing the actuator thereupon to be rotated inwardly similarly rotating the offset cranks releasing the same from the latches and allowing the crib drop side to drop,

spring means normally aiding the weight of the drop side to hold the offset cranks in said notches, and

including a generally horizontal extension on each said bracket, said extensions being apertured to slidingly receive the drop side guide rods, said spring means being

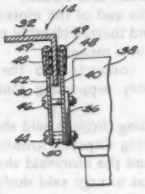
interposed between said horizontal extension and the top surface of said lower rail of the drop side.

3,934,283

BED FRAME WITH READILY CONNECTABLE VIBRATOR MOTORS

Marvin J. Raffel, 9094 N. 75th St., Apt. 1B, Milwaukee, Wis. 53223

Filed June 17, 1974, Ser. No. 479,703
Int. Cl.² A61H *1/000*
U.S. Cl. 5—109 2 Claims



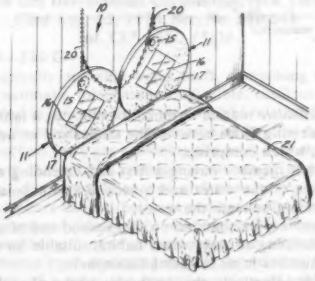
1. The combination comprising a bed structure including a frame having rail portions, a set of springs supported by said frame, at least one vibrator motor, means attaching said vibrator motor to a rail portion, said means comprising clamp arms projecting from said vibrator motor and having ends clampingly engaged with said rail portion, said arms being so disposed on said vibrator motor that the motor is supported in a position offset downwardly from said set of springs to prevent interference therewith, there being a bracket rigidly attached to one side of said vibrator motor and there being a pair of clamp arms attached to each end of said bracket by bolts, and a spacer sleeve around one bolt at each end of said bracket for spacing the clamp arms apart by a gap approximately equal to the thickness of the material of the rail portion to which the clamp arms are attached, said bracket being elongated at opposite ends beyond said vibrator motor to provide access to said bolts.

3,934,284

STEREO HEAD BOARD

John R. Paletta, and Helen Paletta, both of 14522 Seneca Trail, Middleburg, Ohio 44130

Filed Mar. 1, 1974, Ser. No. 447,066
Int. Cl.² A47C *20/00*
U.S. Cl. 5—280 1 Claim



1. A headboard in combination with speakers and mirrors mounted on said headboard, and means to suspend said headboard,

said headboard comprising a pair of circular panels, said panels being secured together at their peripheries by a single flat plate fastened to one side of both of said panels, each of said panels having a speaker and a mirror mounted thereon,

said means to suspend comprising chains suspended from a ceiling, connected to each of said panels, whereby said headboard may be suspended from a ceiling at the head of said bed.

3,934,285

FIRE-RESISTANT FABRICS

Robert Edward May, Pleasant Garden, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 16, 1971, Ser. No. 172,212
Int. Cl.² A47C *27/12*; B05D *3/12*
U.S. Cl. 5—345 R 8 Claims

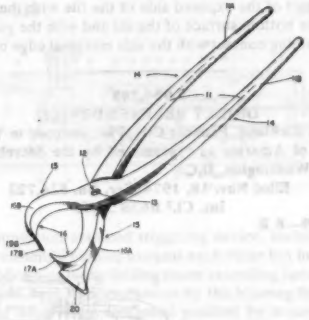
1. A fire retardant textile product comprising a mattress batting assembly which is normally susceptible to burning by a cigarette and a fire retardant fabric positioned on said batting assembly to retard burning thereof, said fabric having a heat conductive coating on its underside adjacent to and in contact with said assembly, said coating comprising a flexible, film-forming polymeric binder having dispersed therein from 30–60% by weight of a flake- or leaf-shaped heat conductive material selected from the group consisting of aluminum and graphite of from 50–400 mesh, the weight of the coating being at least about 2 ounces per square yard of fabric and the amount and size of said heat conductive material and the thickness of said coating being sufficient to carry away the heat of a cigarette falling or placed on the topside of said fabric so as to avoid burning or substantial charring of said assembly.

3,934,286

HAND TOOL

Robert E. Metzinger, Rural Rte. 1, Oxford, Ind. 47971

Filed Jan. 16, 1975, Ser. No. 541,426
Int. Cl.² B25B *7/22*; B25C *11/02*
U.S. Cl. 7—3 A 6 Claims



1. A hand tool for use with electrical wire staples comprising:

a. a pair of levers pivotally connected at a point intermediate to the proximal and distal ends of said levers;

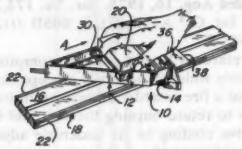
b. handle members being adapted from the portions of said levers located proximal to said point of pivotal connection;

c. first and second coacting jaw members adapted from the portion of said levers located distal to said point of pivotal connection, said coacting jaw members having opposing surfaces, said opposing surfaces having distal edges; and

d. a fulcrum member attached to said first coacting jaw member, said fulcrum member being laterally offset from and parallel to the longitudinal center of said first jaw

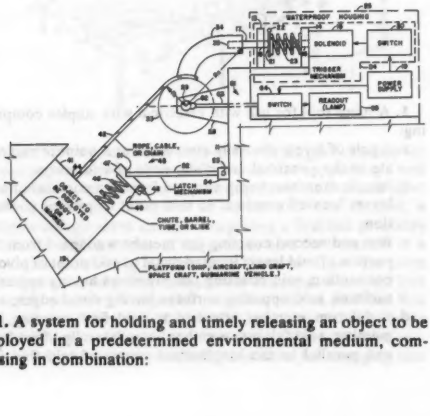
member and extending beyond a plane through said distal edges of said jaw members.

3,934,287
COMBINATION SKI MAINTENANCE TOOL
G. Wix Howard, P.O. Box 16194, Denver, Colo. 80216
Filed Jan. 6, 1975, Ser. No. 538,950
Int. Cl.² B26B 27/00; B24B 15/00; B25F 1/00
U.S. Cl. 7—14.1 R 25 Claims



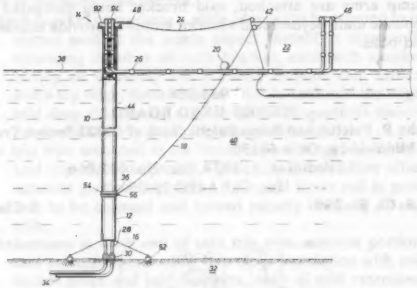
1. A combination ski-maintenance tool comprising:
a laterally and longitudinally extensive shallow body having a first face and a second face;
at least a portion of the first face lying in a common plane;
guide means extending outward from the common plane to define a guide line for directional control of longitudinal movement of the body;
the guide means being arranged to contact and glide along a side marginal edge of a ski when the first face of the body is located in parallel overlying relation to the bottom surface of the ski to guide the body in longitudinal travel along the axis of the ski;
a file carried by the body;
the first face of the body being formed to receive and retain the file with a flat side exposed and parallel to the plane of the first face and with the axis of the file extending across the face at a substantial angle to the guide line defined by the guide means for direct planar cutting contact of the exposed side of the file with the full width of the bottom surface of the ski and with the guide means in guiding contact with the side marginal edge of the ski.

3,934,288
OBJECT RELEASE DEVICE
James L. Kirkland, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 18, 1974, Ser. No. 524,722
Int. Cl.² B63B 51/02
U.S. Cl. 9—8 R 19 Claims



1. A system for holding and timely releasing an object to be deployed in a predetermined environmental medium, comprising in combination:
platform means;
a rotatable drum means;
arm means connected to said rotatable drum means for rotation therewith;
means connected between said platform means and said rotatable drum means for supporting said drum means in such manner as to allow relative rotation therebetween;
cable means extending around said arm means and around a portion of the periphery of said drum means;
an object, intended to be deployed in said predetermined environmental medium, connected to the end of said cable means that is opposite the end thereof that extends around the aforesaid arm means;
a hole located in the end of the aforesaid arm means;
a shaft, with one end thereof slidably movable in and out of the hole of said arm means;
means effectively connected to the aforesaid platform means for slidably supporting said shaft with respect thereto;
a cotter pin extending through said shaft; and
a compressible spring disposed around said shaft between said cotter pin and the aforesaid shaft supporting means in such manner as to urge said shaft in such direction as to cause it to be timely inserted in the hole in the end of said arm means until moved out thereof in response to a predetermined signal.

3,934,289
MARINE FLUID TRANSFER APPARATUS
Clarence W. Shaw, Metairie, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.
Filed Jan. 6, 1975, Ser. No. 538,951
Int. Cl.² B63B 21/52
U.S. Cl. 9—8 P 15 Claims



1. An offshore marine terminal for mooring a tanker vessel and transferring fluids between the tanker and an underwater manifold, which comprises:
a buoyant member having a first end extending above the surface of the water and a second end submerged and extending beneath the water;
a bathyal service chamber on said second end of said member defining an underwater habitat suitable for maintaining humans in an artificial atmosphere;
means to selectively change the buoyancy of said member from a first lowered condition, in which said bathyal service chamber is positioned around said manifold to provide access to said manifold in a dry environment, to a second elevated positioned in which said member is disposed above said manifold; and
flow lines to transport the fluid, through said chamber, between the manifold and the vessel.

3,934,290
SWIMMING SYSTEM

Kenneth W. Le Vasseur, 91-591 Aikanaka Road, Ewa Beach, Hawaii 96706

Filed May 20, 1974, Ser. No. 471,545
Int. Cl.² B63C *11/04*; A63B *31/10*
U.S. Cl. 9—309 17 Claims

1. The swimming apparatus comprising a foot fin having a broad fluke area and having a narrower foot receiving section in another portion, the foot receiving section comprising adjacent foot pockets separated by a divider, each pocket having a separate upward opening for passing an ankle portion of a foot, first fastening means on the fin and second fastening means for engaging the first fastening means, the second fastening means being mounted along an inner surface of a lower edge of a leg receiving sheath, the leg receiving sheath comprising a slick skin having leg receiving means for holding legs for movement together, and having a longitudinal opening for inserting legs, and having a leg divider centrally longitudinally mounted on an interior of the skin for cushioning and separating legs, the leg receiving sheath having a hip receiving portion and having an upper reinforcement band surrounding an upper edge of the hip receiving portion.

3,934,291
WATER SPORTS WHEEL

Frederic Hagen, New York, N.Y., assignor to Douglas Leigh Research and Development Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,041
Int. Cl.² A63C *15/04*
U.S. Cl. 9—310 G 1 Claim

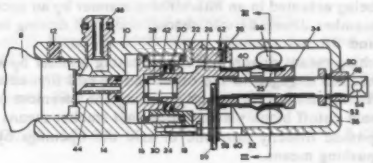
1. A manually operable water craft, comprising a pair of circular pneumatic tubes made of flexible, resilient material and arranged in spaced side-by-side upright relation for rotary motion on the surface of a water mass and forming two closed circular pockets for a gas providing the craft with the desired buoyancy in the upright rotatable positions of said tubes, a plurality of diametrically spaced and transversely extending holding members located between and connecting said circular tubes in spaced side-by-side relation, said transverse holding members being formed at both outer ends to provide tube gripping means each enclosing in gripping relation the inner wall portion of a tube, the central portions of said holding members being configured to provide centrally of the craft diametrically spaced hand grips for the operator, and said holding members between said outer tube gripping means and said central portions thereof being each configured to form two outwardly projecting spaced paddles, the paddles of said holding members being aligned to form two spaced series of circumferentially spaced paddles adapted to convert rotary motion of the craft into linear motion on the water mass, a series of arcuately-shaped, perforated panels aligned with each series of paddles with the panels in each series thereof located between the paddles aligned therewith, and means connecting the ends of the panels in each series to said holding members at the root portions of the paddles with such panels

to provide within the two series of paddles two circular treads on which an operator within the craft walks to cause rotation of said tubes, said two spaced aligned series of tread panels and paddles providing a central circular opening therebetween interrupted only by the central portions of said holding members extending across said opening to provide hand grips for the operator.

3,934,292
TRIGGERING DEVICES

Ciaran Joseph Mulderrig, London, England, assignor to BOC Limited, London, England

Filed Mar. 27, 1975, Ser. No. 562,647
Claims priority, application United Kingdom, Apr. 3, 1974, 14809/74
Int. Cl.² B63C *9/18*; F16K *17/14*; B67B *7/28*
U.S. Cl. 9—318 10 Claims



1. An immersion-actuated triggering device, including two members resiliently biassed towards each other but held apart by means of two or more folding struts extending between the members and kept in compression by the biassing force, the struts being kept in an elongated position by means of the tensions in one or more pieces of a material of which the tensile strength reduces greatly when it is wetted, whereby the struts collapse by folding outwardly when the material is wetted, the resultant relevant movement of the two members towards each other being effective to trigger an associated mechanism.

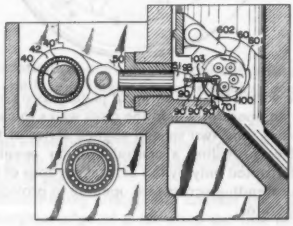
3,934,293
FEEDING DEVICE FOR WIRE STOCK IN A HIGH SPEED COLD HEADING DEVICE

Yuan Ho Lee, 85, Jen Ho Road, Tainan, China /Taiwan

Filed Aug. 6, 1974, Ser. No. 495,141
Int. Cl.² B21K *1/44*; B23G *11/00*
U.S. Cl. 10—13 7 Claims

1. In a heading machine for making headed goods from wire stock, the combination comprising:

a frame;
first eccentric driving means connected to a source of power by connecting means;
cutting die means;
means for feeding said wire stock into said cutting die means;
reciprocating cutting means including a cutting tool, said reciprocating cutting means being driven in a reciprocating fashion by second eccentric driving means connected to said first eccentric driving means for cutting the stock produced from said cutting die means to form cutoff blank pieces from said wire stock;
means for contacting the foremost end of said wire stock to adjust the length of said cutoff blank pieces;
stacker means for directly receiving the cutoff blank pieces from and at a position opposite said reciprocal cutting means;



retaining means pivotedly mounted on said stacker means for retaining and holding the cutoff blank pieces one by one in a closely stacked substantially horizontal linear arrangement within said stacker means so that the foremost one of said cutoff blank pieces within said stacker is positioned in alignment with the center line of a die opening in a rotary die head;
said rotary die head having a plurality of die openings, and being actuated in an intermittent manner by an eccentric member driven by said second eccentric driving means; and
pushing means driven in a reciprocating manner by a connection engaged to the other end of said first eccentric driving means for directly causing the foremost one of said cutoff blank pieces within said stacker means to be pushed directly into one of said die openings by said pushing means.

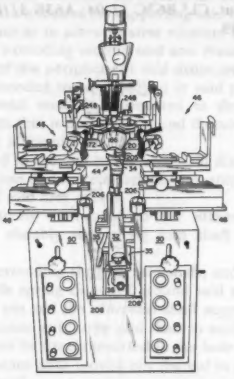
3,934,294

LASTING MACHINE AND METHOD

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Dec. 9, 1974, Ser. No. 530,927
Int. Cl.² A43D *21/00*
U.S. Cl. 12—145 **6 Claims**

6. A method of heel lasting by means of heel wiping means that are symmetrically disposed about a forwardly-rearwardly extending line of symmetry and that are mounted for forward movement from a retracted position to an advanced position in a heel wiping stroke comprising: so supporting by support means a shoe assembly formed of a last having an upper mounted thereon and an insole located on its bottom that the heel of the shoe assembly faces the heel wiping means and is located forwardly of the heel wiping means when the heel wiping means is in its retracted position whereby the heel wiping stroke causes the heel wiping means to wipe the heel portion of the margin of the upper against the insole; initially maintaining the heel wiping means in its retracted position; thereafter so swinging the support means about an upright axis that is in approximate coincidence with the heel end of the shoe assembly as to bring the heel portion of the shoe assembly into symmetrical relationship with said line of symmetry;



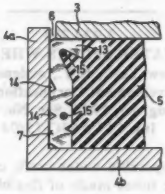
and thereafter imparting a heel wiping stroke to said heel wiping means.

3,934,295

ROCKER BEARING FOR BRIDGES ON SIMILAR STRUCTURES

Waldemar Koster, Forsbach, Germany, and Reinhold Huber, Rorbas, Switzerland, assignors to Firma Kober AG, Glarus, Switzerland

Filed Jan. 28, 1974, Ser. No. 437,238
Claims priority, application Germany, Feb. 6, 1973, 2305749; May 17, 1973, 2325141; July 26, 1973, 2337890
Int. Cl.² E01D *19/06*
U.S. Cl. 14—16 **28 Claims**

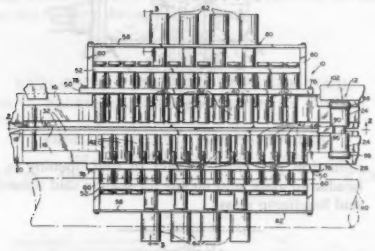


1. A rocker bearing comprising upper and lower bearing members having opposed bearing surfaces for supporting loads applied to one of the other said members, an elastic pressure cushion interposed between the bearing surfaces, said elastic pressure cushion having its periphery at least in part enclosed by at least one peripheral casing wall, a plurality of lamellae embedded within said elastic pressure cushion adjacent one bearing surface and spaced about the periphery thereof, each of said lamellae being formed of a material less resilient than said elastic pressure cushion and having a narrow edge extending parallel to said one adjacent bearing surface and a narrow edge extending parallel to the surface of said peripheral casing wall, each of said edges being arranged within said cushion to abut the respective surfaces on application of a load to said bearing members.

3,934,296
WHEEL CLEANERS

Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201

Filed Aug. 24, 1972, Ser. No. 283,544
Int. Cl.² B60S 3/04
U.S. Cl. 15—53 B 10 Claims

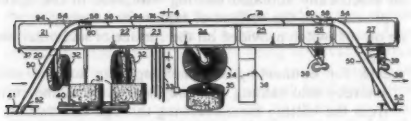


1. In combination,
a track along which wheels of one side of a car may be rolled,
a wheel pushing conveyor including a chain and pusher means pulled by the chain and adapted to engage one of the wheels to push the car along the track,
means for guiding the chain along a path having a first portion at one level and a second portion at a lower level,
wheel spinning means including wheel spinning elements positioned over the portion of the chain in said second portion,
and brush means for brushing the wheel,
the wheel spinning means having a slot extending longitudinally of the track,
the pusher means including a pusher for engaging the wheel and an arm connecting the pusher and the chain and extending through and movable along the slot,
the wheel spinning means including a pair of endless belt means on opposite sides of the slot and drive means for driving the belt means.

3,934,297
OVERHEAD CAR WASHES

Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201

Filed June 14, 1974, Ser. No. 479,230
Int. Cl.² B60S 3/06
U.S. Cl. 15—53 AB 12 Claims

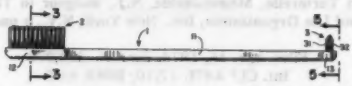


1. In an improved overhead car wash,
a pair of side arches,
an overhead framework rigidly joining the side arches, said framework comprising a plurality of modules comprising box-like frames secured together and to the side arches,
and brushing and cleaning mechanisms supported by the overhead framework, each of said modules supporting at least one of said brushing and cleaning mechanisms, said box-like frames and said side arches providing a unified integrated structure both for supporting said mechanisms and for providing a structure to house the same.

3,934,298
TOOTHBRUSH

James S. H. Kim, 105 Kingston Court, New Orleans, La. 70114

Filed Apr. 23, 1974, Ser. No. 463,205
Int. Cl.² A46B 9/04
U.S. Cl. 15—167 R 10 Claims

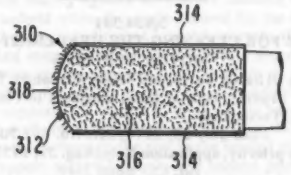


5. An interdental toothbrush comprising:
an elongated handle having an end portion with a top side; and
a relatively small interdental brush portion mounted on said end portion on said top side consisting of a single group of parallel, juxtaposed tufts, defining at least generally a rectangular configuration, of parallel bristles emanating out from said handle in a direction perpendicular thereto, said tufts forming a series of even numbered, parallel rows aligned parallel in a direction transverse and perpendicular to the longitudinal axis of said handle, the ends of said bristles of said juxtaposed tufts of said rows together forming a single wedge-shape having two outward facing, flat bevel surfaces symetrical to each other, the top side of said end portion of said single group of tufts, forming said single wedge-shape, being otherwise clear of any other tufts of bristles or other substantial projections, the total size of the wedge-shape formed by said tufts being of an interdental size for fitting in between the sides of two juxtapositioned teeth with said bevel surfaces contacting the sides of the teeth; whereby said interdental brush portion can be used as a most effective interdental and periodontal cleanser and as an interdental stimulator without a traumatic effect on the crest of the interdental papillae.

3,934,299
TOOTH CLEANING DEVICE

Willard D. Regester, 2100 Sierra Ventura, Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 31,712, April 24, 1970, abandoned. This application July 13, 1972, Ser. No. 330,811
Int. Cl. A46b 5/04
U.S. Cl. 15—104.94 2 Claims



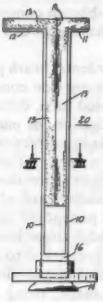
1. A tooth cleaning device comprising: a tubular body of terry cloth material having a continuous outer fabric surface throughout substantially its entire length, the body having a pair of opposed flexible fabric members, the members being integral with each other at one extremity of the body to provide a closed end therefor, the members being welded together only at the side margins thereof to define a pair of spaced ribs with the ribs being generally parallel with each other, providing continuations of said outer surface, and extending substantially the entire lengths of the side margins from said one extremity to the opposite extremity of the body,

said opposite extremity being open to permit the body to be placed on the finger and inserted in the mouth for engaging the teeth, said body being impregnated with a dentifrice material.

3,934,300
DRINKING GLASS CLEANER

Albert Tortorello, Mountainside, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 15, 1974, Ser. No. 460,970
Int. Cl.² A47L *17/10*; B08B *9/00*
U.S. Cl. 15—244 R **1 Claim**



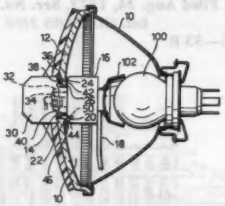
1. A device for cleaning the inside and outside surfaces of a cylindrical drinking glass is comprising a pair of tong members having parallel intermediate sections flexibly joined together at one end so that they may be moved to or away from each other with a section of absorbent sponge material fastened to each of the adjacent surfaces of each tong member, in which the free end of each tong member is bent at right angles away from the intermediate section of the tong member with the absorbent sponge material fastened along the length of the intermediate section and the said bent end of each tong member to form a shaped absorbent sponge surface generally parallel to the planes of the attached intermediate section and the bent end of the tong member and means on the joined portion to fasten the device to a flat surface, the bent end section of each tong member and its respective sponge material being of different lengths so that each tong member is suitable for cleaning the inside wall and inside bottom surface of a drinking glass of a different internal diameter.

3,934,301
DEVICE FOR CLEANING THE HEADLIGHT GLASS ON MOTOR VEHICLES

Salvatore Di Salvo, Turin, and Mario Morlondo, Testona-Moncalieri (Turin), both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed July 25, 1974, Ser. No. 491,704
Claims priority, application Italy, Aug. 31, 1973, 69600/73
Int. Cl.² B60S *1/44*
U.S. Cl. 15—250.22 **9 Claims**

1. In a device for cleaning the headlamp glass of an automobile headlamp, having:
a motor,
a reduction gear,
a wiper blade carried by said reduction gear, and conductors for the supply of electricity to said motor, said motor and said reduction gear being adapted to be mounted directly on a headlamp glass, the improvement comprising:
means for attaching said motor and said reduction gear together through an opening in said headlamp glass such that said motor is located inside said headlamp and said reduction gear is located externally of said headlamp; means for locating said motor and said

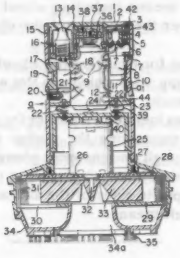


reduction gear with respect to said opening in said headlamp glass, and means for sealing said opening in said headlamp glass.

3,934,302
PORTABLE, MULTI-PURPOSE, RECHARGEABLE CIGARETTE LIGHTER

Kenichi Mabuchi, 3-34, Mita 2-chome, Minato, Tokyo, Japan

Filed Nov. 8, 1973, Ser. No. 413,764
Claims priority, application Japan, Nov. 14, 1972, 47-114183; Dec. 12, 1972, 47-124497
Int. Cl.² A47L *5/24*, *7/00*; F21V *33/00*; F23Q *7/16*
U.S. Cl. 15—339 **6 Claims**



2. A portable, battery-operated multi-purpose cigarette lighter adapted to be operated by battery means comprising:
an outer housing having at least one opening on the outer surface thereof;
an electric cell housing in said outer housing and adapted to receive the battery means;
an electrically actuated heating wire held in the opening provided on the surface of said outer housing;
an on-off switch provided on the surface of said outer housing;
means for connecting said heating wire to said switch whereby said heating wire may be heated by the current from the battery means flowing through said switch;
a motor disposed within said outer housing, the output shaft of said motor being located adjacent the lower part of said housing;
a vacuum cleaner housing, the upper portion of which is located in the lower part of said outer housing;
a fan provided within said vacuum cleaner housing and rotatably secured on the output shaft of said motor;
a filter frame inserted removably into said vacuum cleaner housing and having a filter at the periphery thereof;
a dust pan having a central suction opening and a dish-shaped member at the periphery thereof, the upper portion of which is removably fitted to the lower portion of said vacuum cleaner housing;

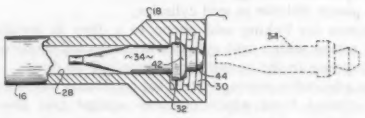
brushes having one end thereof embedded around the peripheral portion of said suction opening in the bottom surface of said dust pan the other end of said brushes defining a support surface that is in a plane that is transverse to the longitudinal axis of said outer housing whereby said lighter is capable of independently standing upright on said brushes; and

means for connecting said motor to said switch whereby said motor may be driven by the current from the battery means flowing through said switch.

3,934,303
EXPLOSIVE TORCH TIP CLEANER TOOL

Marvin C. Neithercutt, 2600 Frontier Drive, Midland, Tex. 79701

Filed Aug. 29, 1974, Ser. No. 501,640
Int. Cl.² A47L 5/00; F23J 1/00
U.S. Cl. 15—406 4 Claims



1. In a hand-held torch tip cleaning apparatus for effecting a high pressure differential across the flow passageway of a torch tip removably contained within the apparatus and from which debris causing obstruction thereof is to be ejected, the combination comprising:

a central body member having a central bore formed therethrough with a marginal length of said central bore being sized to removably receive a blank cartridge concentrically arranged in axially aligned relationship therein and seated at one marginal end therein;

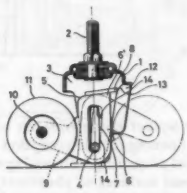
a breech member removably affixed to the cartridge containing end of said central body member, said breech member having an axial bore which is axially aligned with said central bore, a spring loaded firing pin assembly slidably received in axial alignment with respect to said axial bore and with the detonator of the cartridge, such that the firing pin assembly is yieldably biased away from the cartridge; said firing pin assembly having an elongated shaft axially aligned with said central and axial bore and extending away from and clear of said breech member a distance at least equal to the longitudinal axial length of the central bore formed through said central member; so that the breech member can be removed from the central member and said shaft can then be used to forcibly remove a spent cartridge from seated relationship within said central member;

a torch tip holding member having an axial bore formed therethrough with a free depending end portion thereof being made into the form of a muzzle, the opposed end portion of said holding member being removably affixed in axially aligned relationship to said central body member, a marginal length of the last said axial bore being sized to removably receive a torch tip therein such that the flow passageways of the torch tip are axially aligned with said axial bore; the outer periphery of the torch tip being sealingly engaged with the inner periphery of the last said axial bore so that when a torch tip is placed into the torch tip holder and a blank cartridge is placed into the central body member, the firing pin assembly can be struck, thereby causing the primer engaging end thereof to move into contact with and detonate the explosive charge thereof, thereby causing the explosive gases to develop a high pressure differential across the torch tip, and the explosive gases to flow through the passageways of the torch tip to thereby enhance removal of any obstruction therefrom.

3,934,304
SWIVEL CASTORS

Sasuke Takahashi, 34/11, Yasunakacho-6-Chome, Yao, Osaka, Japan

Filed Sept. 24, 1974, Ser. No. 509,358
Int. Cl.² B60B 33/06
U.S. Cl. 16—34 4 Claims



1. A locking swivel castor for attachment to the leg of a table or to the bottom of a like item having a rotary wheel in contact with the surface beneath the object being upheld, said castor comprising:

slotted L-shaped support means connected to said rotary wheel for rotatably supporting said wheel and locking said castor into position, said support means having:

a first portion of the L-shape,

a first shaft fitted through said first portion at the end opposite the angle of the L-shape for rotatably supporting said wheel,

a second portion of the said L-shaped angled from said first portion, said second portion having a longitudinal slot running therethrough from the angle between the two portions toward the tip of the second portion, and

a support stand fixed to the end of said second portion opposite the angle formed by the first and second portions for resting against the surface beneath the item being upheld when the angle formed by the first and second portions is directed upward, whereby the castor is locked into position and is not free to move; and

swivel framing means attached to the bottom of the item being upheld for swiveling and vertically adjusting said L-shape support means, said framing means having:

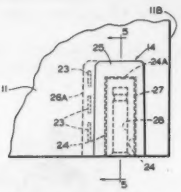
a second shaft stationarily fixed at the bottom thereof and loosely fitted through the slot in the second portion of said support means, whereby the second portion can slide along and rotate about the second shaft,

stopping plate means fitted therein for abutting against the support stand when the second portion of the L-shape and the support stand attached thereto are rotated about the second shaft and the angle formed by the first and second portions is directed downward, whereby rotating the second portion and the support stand about the second shaft away from the locking position toward the stop plate means causes the slot in the first portion to slide along the second shaft and the support stand to abut against the stop means, thereby lifting the support stand away from the surface and unlocking the swivel for free rotation.

3,934,305
CASTER SOCKET

Walter Gusdorf, Creve Coeur, Mo., assignor to Gusdorf & Sons, Inc., St. Louis, Mo.

Filed Oct. 10, 1974, Ser. No. 513,552
Int. Cl.² A47B 91/00
U.S. Cl. 16—43 10 Claims

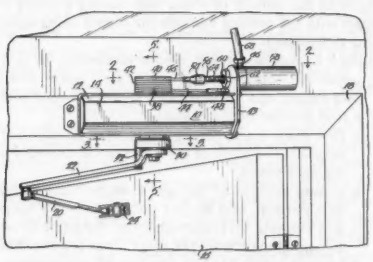


1. A caster socket comprising an elongated body formed with a socket opening for the reception of a caster swivel post, a pair of flanges projecting from and spaced apart by said body to form opposed surfaces of abutment, and means on one of said flanges for locating and receiving securing means.

3,934,306
DOOR CLOSURE DEVICE

Vernie L. Farris, Houston, Tex., assignor to Federal Sign and Signal Corporation, Blue Island, Ill.

Filed Jan. 6, 1975, Ser. No. 538,762
Int. Cl.² E05F 15/20
U.S. Cl. 16—48.5 13 Claims

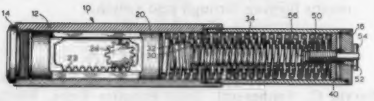


1. A door closer mechanism for automatically closing a door in response to a predetermined condition, the improvement comprising, in combination, a housing, a rotatable power shaft mounted in said housing and having a portion extending therefrom, force-producing means within said housing associated with said power shaft for rotatably biasing the latter in a door-closing direction, a door closure arm connected with a door to be controlled, said door closure arm being supported on said power shaft so as to be freely rotatable thereon, crank means fixedly mounted on said power shaft for conjoint rotation therewith, said crank means being engageable by said door closer arm when the latter is initially rotated in a door-opening direction thereby cocking said crank means and associated force-producing means while said door remains freely movable manually to any desired position between its fully open and fully closed positions, normally operable one-way brake means associated with said power shaft for preventing rotation of the latter in a door-closing direction, and means responsive to a predetermined condition for releasing said brake means enabling said force-producing means to rotate said power shaft and crank means in a door-closing direction whereby said crank means actuates said door closure arm to effect closing of said door.

3,934,307
SPRING ADJUSTMENT MECHANISM

Thomas R. Lasier, and Roy Pollack, 229 N. Homer St., both of Princeton, Ill. 61356

Continuation of Ser. No. 263,946, June 19, 1972, abandoned.
This application May 9, 1974, Ser. No. 468,245
Int. Cl. E05f 1/08
U.S. Cl. 16—79 7 Claims



1. An adjustable door closure mechanism adapted for use with a door which is movable between a door closed position and a door open position comprising:

a cylinder housing;

a piston slidable in said cylinder;

means for linking said piston to a door to translate said piston within said cylinder in a selected direction in response to the opening movement of the door;

an adjustable biasing system for producing a resultant door closing force which operates against said piston; said biasing system comprising a plurality of compression spring means having unequal lengths extended within said cylinder and separately engageable with said piston as said piston is translated in said cylinder by the opening movement of the door so that each spring means applies a separate closing force to said piston;

said plurality of compression spring means nested within one of said spring means;

said spring means being arranged within said cylinder in a first condition in which at least one first spring means contacts said piston in the door closed position and at least one second spring means is spaced from said piston in the door closed position;

said second spring means positioned to engage said piston at a selected position as said piston is translated within said cylinder by the opening movement of the door from closed door position whereby said plurality of spring means cooperate to produce a first resultant door closing force permitting said closure mechanism to control the closing movement of the door with a first set of physical characteristics; and

closing force adjustment means positioned within said housing for controlling said plurality of spring means to change said separate closing force of said first spring means, to change the location of engagement within said cylinder between said piston and said second spring means as said piston is translated within said cylinder, and to arrange said plurality of spring means in a second condition which causes said separate spring means to cooperate and to produce a second resultant door closing force and thereby to adjust said mechanism for closing a door with a second set of physical characteristics;

whereby said closure mechanism is readily adjustable in the field for use with a plurality of doors having different physical characteristics.

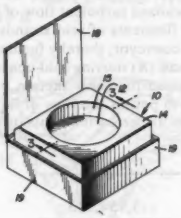
3,934,308
HAMBURGER PATTY PRESS

Joseph R. Neri, 3101 Quentin Road, Brooklyn, N.Y. 11234

Filed Aug. 26, 1974, Ser. No. 500,311
Int. Cl.² A22C 7/00
U.S. Cl. 17—32 10 Claims

1. A molding device which comprises in combination: a stationary horizontal base plate, a mold having a through opening providing a molding cavity adapted to accommodate material to be molded, said mold being movably mounted with respect to said base plate, resilient means associated with said base plate and mold for urging said mold away from said base

plate when said mold is pressed towards said base plate, a core element detachably secured to said base plate and being disposed in registering relation with said molding cavity, said mold being relatively movable between a first position in which said core element is disposed in the lower portion of said molding cavity and a second position in which said core



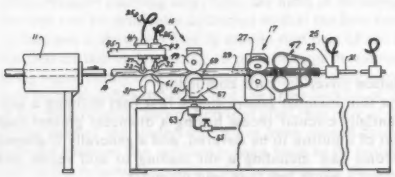
element is disposed upward from said first position, retaining means associated with said core element and said mold for retaining said mold and core element in said first position when said mold device is in non-operating condition and pressing means associated with said mold for compressing said material in said cavity against said core element and for moving said mold from said first position to said second position.

3,934,309

ZONE REGULATION OF CASING INFLATION GAS

Arthur L. Sheridan, Woodridge, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,207
Int. Cl.² A22C *11/00*
U.S. Cl. 17—42 **5 Claims**



1. In a system for the production of flexible film tubing which system includes means for continuously introducing an inflation gas into the interior of the tubing and means for continuously unidirectionally advancing the tubing from a first zone to a second zone,

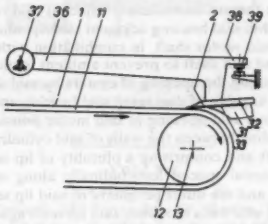
apparatus to maintain a preselected inflation gas pressure differential between the first zone and the second zone comprising, in combination: A base roll having a substantially flat circumferential surface in contact with the advancing tubing; a first flat nip roll disposed in first tubing nipping relationship relative to said base roll; a second flat nip roll disposed in second tubing nipping relationship relative to said base roll and spacedly adjacent said first nip roll; means to selectabiy vary the tubing nipping relationship between the first nip roll and the base roll; and means to selectably vary the tubing nipping relationship between the second nip roll and the base roll; whereby a continuous succession of inflation gas accumulation chambers is formed in the advancing tubing between the base roll and the first and second nip rolls, and successive inflation gas quantities in said accumulation chambers are passed from one of said zones to the other.

3,934,310

SKINNING MACHINE FOR FISH FILLETS

Alfred Bartels, Lubeck-Israelsdorf, and Herbert Kohn, Bad Schwartau, both of Germany, assignors to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Oct. 15, 1974, Ser. No. 514,436
Claims priority, application Germany, July 13, 1974, 2433782
Int. Cl.² A22C *25/02*
U.S. Cl. 17—62 **1 Claim**



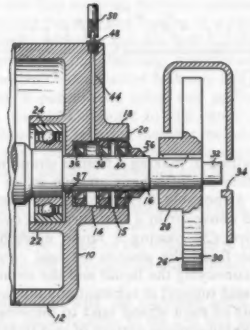
1. A skinning machine for fish fillets including a machine frame, a moving conveying surface for the skin side of a fish fillet, an endless band knife slightly inclined against the direction of travel of the conveying surface, and a knife guide essentially comprising a knife support and a knife cover exposing the cutting edge of the band knife in the region of the conveying surface, wherein the band knife is inclined towards the conveying surface at an angle of about 5°, its cutting edge being formed by two chamfers including a cutting angle of essentially 30° to 40° between them; the chamfer adjacent to the conveying surface includes an angle of intersection of between 10° and 20° with the latter; said knife guide is supported by a supporting arm pivoted about a shaft parallel to the cutting edge and having resting elements adjacent to the knife guide, said resting elements coacting with stop means adjustably mounted on the machine frame; and said shaft is situated close to the plane comprising the chamfer facing the conveying surface.

3,934,311

OYSTER BREAKER OPERATED BY ELECTRIC MOTOR HAVING BEARING SEAL DEVICE

John W. Thompson, Box 1946, R. D. No. 5, York, Pa. 17405

Continuation-in-part of Ser. No. 379,058, July 13, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,619
Int. Cl.² A22C *29/04*
U.S. Cl. 17—74 **4 Claims**



1. An oyster breaker comprising in combination, a housing having an opening through which the lip of an oyster is to be

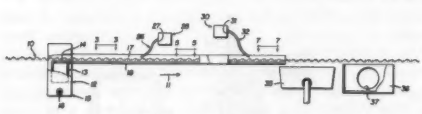
inserted, a rotatable shearing disc member having a shearing member projecting from one face thereof and cooperable with an edge of said opening to shear a portion of the lip of an oyster therefrom to form an opening for the insertion of an oyster knife therethrough, an electric motor mounted directly adjacent said housing and having a shaft with one end projecting into said housing, said rotatable shearing disc being mounted upon said one end of said shaft of said electric motor, said motor having a housing provided with a cylindrical opening in one end complementary to and through which said one end of the motor shaft projects for connection of said shearing disc thereto immediately adjacent said opening, and a bearing within said housing adjacent said opening to support said end of said motor shaft, in combination with seal means for said end of said shaft to prevent ambient liquid substances originating during the opening of oysters by said shearing disc member and capable of damaging said bearing and shaft from passing through said opening in said motor housing, said seal means extending between the walls of said cylindrical opening and said shaft and comprising a plurality of lip seals of compressible material spaced longitudinally along said walls of said opening and the outer periphery of said lip seals frictionally engaging said walls to secure said lip seals against rotation within said opening, said lip seals each having a similar flange extending integrally and radially from the outer portions of said seals into close slidable sealing engagement with said shaft, said flanges all extending angularly away from said bearing and the space between two of said lip seals and flanges defining a lubricant chamber therebetween, and said motor housing having a lubricant passage extending from the exterior upper portion of said housing downwardly into said lubricant chamber, whereby when lubricant is forced through said passage and into said chamber the flange on the lip seal nearest said bearing functions as a one-way valve by being forced into close sealing engagement with said shaft to prevent the passage of lubricant past said flange but lubricant being capable of passing between the flange on the other lip seal of said two lip seals and moving along said shaft to flush the engagement of the flange of said other lip seal with said shaft and thereby form a barrier seal to prevent ingress of said aforementioned ambient substances through said lubricant chamber.

3,934,312

METHOD OF AND APPARATUS FOR MAKING CONTINUOUS STRAND MAT

Robert G. Trout, Prairie Village, Kans., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 26, 1974, Ser. No. 500,798
Int. Cl.² D01D *11/02*
U.S. Cl. 19—66 T **7 Claims**



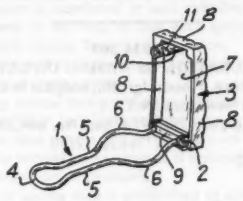
1. In a method of making a fibrous strand mat, the steps of: (1) depositing multifilament strands in an overall sinuous pattern on a movable foraminous collection conveyor, (2) moving said conveyor in a first direction over a non-foraminous support, (3) passing a liquid upwardly through said conveyor to flood the strands on said conveyor with said liquid, (4) conveying the liquid and the strands with the conveyor over said support at substantially the same speed so that the filaments of each strand tend to disperse while retaining the initial overall sinuous pattern of said strands, (5) vertically impinging a counter-current stream of additional liquid onto the flooded strands supported on said conveyor to create a localized turbulent flow of liquid displacing at least some of the filaments of each strand in a direction counter to the direction of movement of said conveyor, thereby locally dispersing said filaments from the initial overall sinuous pattern of said strands, (6) conveying the additional liquid and the dispersed strands with the conveyor from the region of localized turbulent flow to retain the filaments as locally dispersed, (7) vertically impinging a con-current second stream of additional liquid onto the flooded strands, the second stream creating a second localized turbulent flow of liquid displacing at least some of the filaments of said strands in the direction of movement of the conveyor, thereby further locally dispersing such filaments, and (8) moving said conveyor bearing the liquid and the dispersed filaments therein beyond said non-foraminous support to permit the flow of liquid through said conveyor, leaving the dispersed filaments on said conveyor in the form of a mat.

3,934,313

BUTTON COVER

Robert Hocq, Boulogne-sur-Seine, France, assignor to Societe Franco-Hispano-Americaine (Francispam), Saint-Gratien and Societe Anonyme dite: Cartier, Paris, both of, France

Filed Nov. 26, 1973, Ser. No. 418,986
Claims priority, application France, Nov. 29, 1972, 72.42414
Int. Cl.² A44B *1/16*
U.S. Cl. 24—113 MP **2 Claims**



1. Button cover for cuffs comprising:

a first thin member comprising a first part defining a substantially circular recess having a diameter greater than that of a button to be covered, and a generally U-shaped second part including a slit leading to said recess and having a width less than said diameter,

a second generally box shaped member having a bottom dimensioned to cover said button and sides adapted to lie on opposite sides of a button covered by said bottom,

connecting means located in said second member adjacent one side thereof and pivotally connecting said second member to an end of said first part of said first member remote from said second part, said first and second members being pivotable with respect to each other between an open position wherein said first and second members are at an angle of substantially 90° to each other and a closed position in which said bottom and first member are parallel,

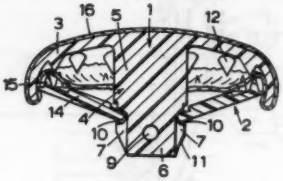
the sides of said second member other than said one side being dimensioned to leave a small gap between themselves and the plane of the nearest surface of said first member parallel to said bottom when said first and second members are in said closed position, the width of said gap being equal to the thickness of a cuff, and

fastening means for fastening said first and second members to each other in said closed position, said fastening means comprising a projection located in said second member close to the side thereof opposite said one side, said projection being provided with at least one lateral recess which resiliently engages a side of said slit when said first and second members are in said closed position.

3,934,314
BUTTONS

William Arthur Whysall, Albrighton, England, assignor to Newey Goodman Limited, Birmingham, England

Filed Apr. 8, 1974, Ser. No. 459,163
Claims priority, application United Kingdom, Aug. 8, 1973, 37510/73
Int. Cl.² A44B 1/12
U.S. Cl. 24—113 R 5 Claims



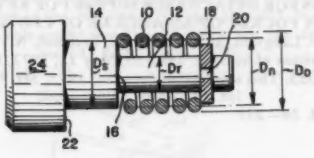
1. Button components for a button of the kind comprising a support, a piece of fabric extending over the front of the support and around the edge of the support to the rear thereof, and a retainer assembled with the support, at the rear of the support, the marginal parts of the fabric being trapped between the retainer and the support, said components comprising a support and a retainer, the support comprising a head with an axial stem at the rear formed with undercutting constituted by at least one preformed undercut, and the retainer comprising a wall element of tapered shape and having a central hole which can receive said stem, the cross-section of that part of the stem to the rear of the undercutting having a maximum transverse dimension greater than that of the hole and a minimum transverse dimension less than that of the hole the arrangement being such that when the button is assembled and the stem is inserted into the hole with the narrower end of the retainer pointing away from the head of the support, the retainer can be resiliently deformed so that the hole temporarily assumes a shape such as to enable that part of the stem to the rear of the undercutting to pass through it without itself being significantly deformed and without the periphery of the hole being significantly stretched the cross-section of the stem at the undercutting being such that after that part of the stem to the rear of the undercutting has been passed through the hole the retainer can resiliently snap back to its initial shape, part of the retainer bordering the hole entering the undercutting in the stem so as to maintain the components in the assembled state, and the marginal parts of the fabric being at the same time trapped between the broader end of the retainer and the rear of the head.

3,934,315
HELICAL-SPRING FASTENED ASSEMBLIES

Melvin Millheiser, North Bellmore, and Hugo Wurzel, New York, both of N.Y., assignors to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed July 26, 1974, Ser. No. 492,142
Int. Cl.² F16L 39/00; A44B 19/00
U.S. Cl. 24—230 SL 1 Claim

1. A multi-coil helical spring-fastened assembly comprising, in combination, a first sub-assembly and a companion sub-assembly, said sub-assemblies being self-locked one to the other responsive to one thereof being assembled to the other by being inserted in a cylindrical bore with which said other sub-assembly is provided, said one sub-assembly comprising a stepped-diameter shaft-form member, the smaller-diameter end of which is provided with a ring-seating circumferential groove, a conventional open-ended spring-retaining ring mounted in said groove and providing an artificial shoulder thereon, a multi-coil helical spring positioned between the step of said shaft-form member and said groove-seated retaining ring, said multi-coil helical spring having initially substantially uniform outer diameter such that it is compressed responsive to assembly of said sub-assemblies as aforesaid and

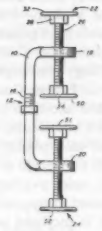


when so compressed it exerts gripping force in radial outward direction on a facing cylindrical bore surface of said companion sub-assembly.

3,934,316
CLAMPING DEVICE

David M. Driscoll, 185 Devonshire St., Boston, Mass. 02110

Filed Aug. 5, 1974, Ser. No. 494,500
Int. Cl.² A44B 21/00; F16G 11/12
U.S. Cl. 24—243 CC 3 Claims



1. A combination clamp and jack comprising;
a support member having a center section and two end sections,
means for securing the center section and end sections to form a unitary support member wherein said end sections can assume different positions relative to the center section,
said means for securing including a first securing member coupling one end of the center section with one end of one of said end sections to permit said one end section to rotate through at least 180° relative to said center section and where said first securing member includes means for fixedly securing the one end section in a clamp position and for fixedly securing the one end section in a jack position, and a second securing member coupling the other end of the center section with one end of the other end section to permit said other end section to rotate through at least 180° relative to said center section and wherein said second securing member includes means for fixedly securing the other end section in a clamp position and for fixedly securing the other end section in a jack position,
the other end of said one end section defining an end surface for engagement with a work piece,
a claimping piece received by the other end of the other end section and having a surface for engagement with a work piece,
and means associated with the clamping piece for moving the clamping piece relative to the one end section of the support member,
whereby said securing members maintain said end sections in a clamp position wherein the work piece engaging surfaces are facing each other, and maintains said end

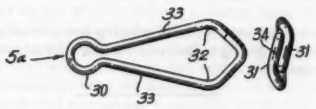
sections in a jack position wherein the work piece engaging surfaces are facing in opposite directions.

3,934,317

MEANS FOR DETACHABLE SUPPORT OF KEYS WITHIN A POCKET OF AN ARTICLE OF CLOTHING

John D. Langwell, 28 Branch Ave., Freeport, N.Y. 11520

Division of Ser. No. 255,783, May 22, 1972, Pat. No. 3,779,053. This application Sept. 24, 1973, Ser. No. 400,132
Int. Cl.² A44B *13/00, 15/00*
U.S. Cl. 24—237 6 Claims



1. A releasable connector comprising a length of resilient material bent to provide a closed loop at one end and a pair of branches with overlapped edge portions at an opposite end to form a closed link, said branches lying substantially in a common plane and including V-shaped shoulders in opposition to one another in said plane, said V-shaped shoulders having apexes facing away from one another, said overlapped edge portions being of V-shape when viewed in a direction perpendicular to said common plane, and being in superposed registry with one another, said V-shape edge portions having respective apexes and legs converging towards said apexes in a direction away from said closed loop, said apexes of the edge portions being disposed along a line substantially midway between said V-shaped shoulders, said overlapped portions also being bent out of said plane, said overlapped portions being of V-shape when viewed in end elevation in a direction parallel to said plane, said overlapped portions converging towards respective apexes in opposite directions so as to mate along a surface which is inclined with respect to said plane, said V-shaped shoulders of said branches being movable relative to one another to open the overlapped edge portions of the link and enable removal of articles from the link.

3,934,318

PIPE CLIP

Hubert Joseph Mertens, Schiekade 37, Rotterdam, Netherlands

Filed Oct. 2, 1974, Ser. No. 511,204
Claims priority, application Netherlands, Oct. 2, 1973, 73113536
Int. Cl.² A44B *21/00;* B21J *13/08;* F16L *13/08*
U.S. Cl. 24—249 R 5 Claims

1. A pipe clamp for centered fixation of pipe ends to be welded together, comprising, in combination:

a chain comprising a plurality of detachably interconnected chain link elements; and

first and second coupling means connected at the respective ends of said chain and operative to cooperate with each other for straining said pipe clamp around said pipe ends;

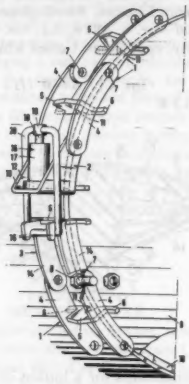
said chain link elements comprising

two lateral elements extending longitudinally with respect to said chain,

a transverse bridge element extending between said two lateral elements and interconnecting them to each other,

a transverse base bar extending between said two lateral elements and interconnecting them to each other, said base bar having a recess defined in a central portion of its side near said pipe ends of sufficient size to permit the passage of a welding electrode therethrough, and

first and second linking means connected at the respective ends of said two lateral elements and operative for pivotal connection to another of said chain link elements and said coupling means, whereby said pipe clamp is flexible and the length of said chain can be



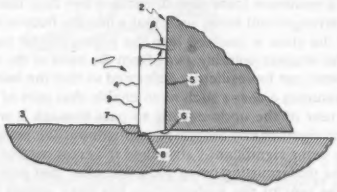
changed to be suitable for pipes having different diameters.

3,934,319

CUTTING INSERTS

Paul A. Schuler, Erie, Pa., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,301
Int. Cl.² B26D *1/00*
U.S. Cl. 29—95 R 7 Claims



1. A cutting insert having top and bottom polygonal faces, the corresponding edges of said faces being joined by flanks, each flank defining at least one cutting edge with at least one adjoining face, each mutually abutting pair of faces and pair of flanks forming at least one cutting edge point, the leading edge of each cutting edge point being beveled, the angle between the plane of the bevel through the cutting edge point to the flank adjoining the bevel being from about 102° to 108°.

3,934,320

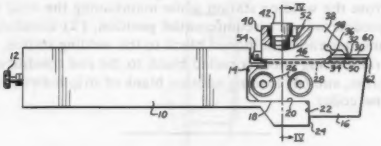
GROOVING AND CUT OFF TOOL

James F. McCreery, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Nov. 1, 1974, Ser. No. 519,879
Int. Cl.² B26D *1/00*
U.S. Cl. 29—96 9 Claims

1. A grooving and cut off tool comprising; a bar-like holder, a support blade fixed to one side of said holder and projecting from one end thereof, said blade having a first longitudinal groove formed in the upper edge thereof, the forward end of which is adapted for receiving an insert, a second longitudinal groove formed in the top of the bar-like holder, a block-like clamping member mounted on said holder and having a longitudinal slot extending upwardly therein from the bottom and defining a pair of dependent leg members on the opposite sides of the clamp member, one said leg member engaging said

second longitudinal groove in the top of the bar-like holder, the other said leg member lying in the plane of said support blade and engaging the first groove rearwardly of the insert with the forward end of said other leg abutting the rearward end of the said insert, resilient clamping means extending forwardly from said other leg over said insert and engaging the top of the insert when said other leg engages said first groove

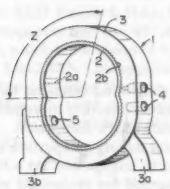


so that when said other leg is seated in said first groove, said resilient clamping means is pressed against the top of the insert, and a clamp bolt extending downwardly through said block-like clamp member between said dependent legs and threadedly engaging said holder, said block-like clamp member being slotted in the fore and aft direction to receive said clamp bolt and to permit fore and aft adjustment of the block-like clamp member on said holder.

3,934,321
ROTOR HOUSING FOR A ROTARY PISTON TYPE ENGINE AND METHOD FOR MANUFACTURING THE SAME

Hirotaka Iida; Hiroshi Masaoka; Michinobu Yamada; Mutsuo Ichihara; Yoshitaka Uebayashi; Koji Tashiro, and Sadao Taketomo, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 9, 1974, Ser. No. 459,329
Claims priority, application Japan, Apr. 10, 1973, 48-40580; Apr. 11, 1973, 48-41639
Int. Cl.² B23P *15/00*
U.S. Cl. 29—156.4 WL **6 Claims**

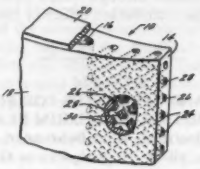


1. Method for manufacturing a rotor housing for a rotary piston type engine having a rotor housing liner with a cold zone located substantially opposite an ignition plug opening, comprising steps of providing a rolled metal sheet, scratching one side of said metal sheet to provide a rough surface, welding opposite terminal edges of said metal sheet together with said rough surface directed outside, forming said metal sheet into a trochoidal configuration to provide a liner with the welded edges disposed within a cold zone of the completed housing, and casting under pressure an aluminum based material around said liner with terminal edges welded to form a housing substrate.

3,934,322
METHOD FOR FORMING COOLING SLOT IN AIRFOIL BLADES

Ambrose A. Hauser, Cincinnati; Terry T. Eckert, Mt. Healthy, and James D. McDonel, Loveland, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 291,005, Sept. 21, 1972, Pat. No. 3,819,295. This application Feb. 14, 1974, Ser. No. 442,325
Int. Cl.² B23P *15/04, 13/02*
U.S. Cl. 29—156.8 H **4 Claims**



1. A method for forming a plurality of polygonal nodes within a trailing edge slot of an airfoil blade, the blade having an internal cavity and a trailing edge, the method comprising the steps of:

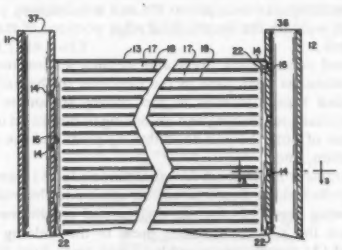
forming at least two sides of each of said polygonal nodes by forming a first plurality of passages extending from said cavity through said trailing edge and aligned in a predetermined first angle other than substantially normal with respect to said trailing edge; and

forming at least two additional sides of each of said polygonal nodes by forming a preselected second plurality of passages intersecting at least a portion of said plurality of passages and extending from said cavity through said trailing edge and aligned in a predetermined second angle other than substantially normal with respect to said trailing edge.

3,934,323
SOLAR HEAT EXCHANGE PANEL AND METHOD OF FABRICATION

Freeman A. Ford, Atherton; Errol Armstrong, Glen Ellen, and Richard O. Rhodes, San Francisco, all of Calif., assignors to Fafco, Incorporated, Menlo Park, Calif.

Filed Oct. 29, 1973, Ser. No. 410,630
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.3 R **10 Claims**



1. The method of fabricating a solar heating panel of the type having a plurality of internal tubular passages therethrough for conducting a fluid for transfer of thermal energy between the panel environment and the fluid comprising the steps of

cutting the panel to a predetermined length along a line transverse to the tubular passage length direction,

cutting a pair of hollow headers for positioning across the ends of the heating panels, forming a plenum chamber on each end of the panel in communication with the internal

passages, spacing apertures in a line along one side of each header, heating the surface of each of the hollow headers on both sides of the line of apertures until it reaches a fluid state, heating the surface on each end of the panel on both sides of the plenum chamber until it reaches a fluid state,

and pressing the heated surfaces of the headers to the heated surfaces on the ends of the panels for forming a bond therebetween as the surfaces cool, thereby obtaining a plurality of continuous flow paths from one header to the other header through which flow is substantially even due to the distribution effect of the plenum chambers.

3,934,324

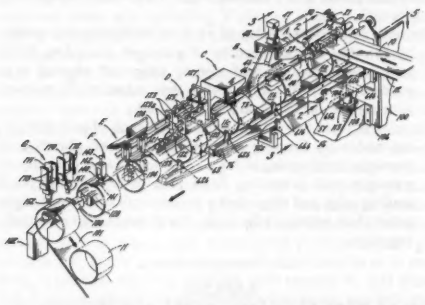
METHOD AND APPARATUS FOR FORMING AUTOMOTIVE WHEEL RIM BLANKS

Johann T. Hess, Deerfield; Kurt Debrunner, and Aujit Tan, both of Chicago, all of Ill., assignors to Grotnes Machine Works, Inc., Chicago, Ill.

Filed Feb. 14, 1975, Ser. No. 549,984

Int. Cl.² B21H *1/10*; B21K *1/38*

U.S. Cl. 29—159.1 **24 Claims**



1. A machine for forming wheel rim blanks comprising the combination of

a. a coiling station for coiling blanks of strip material into the form of a cylinder with the longitudinal edges of the coiled blank defining a preloaded longitudinal gap,

b. an end conditioning press adjacent the coiling station for forming symmetrical longitudinal edge portions on the coiled blank,

c. a welding station adjacent the end conditioning press for butt welding the longitudinal edge portions of the coiled blank,

the end conditioning press and welding station forming a continuous open path in the direction of the axis of the coiled blanks formed in the coiling station to permit simultaneous loading and unloading of blanks on opposite sides of both the end conditioning press and the welding station, and

d. a transfer mechanism for simultaneously (1) transferring a coiled blank from the coiling station to the end conditioning press, (2) transferring an end conditioned blank from the end conditioning press to the welding station, and (3) transferring a welded blank away from the welding station.

15. A method of forming wheel rim blanks comprising the steps of

a. loading a blank of strip material into a coiler and coiling the blank into the form of a cylinder with the longitudinal edges of the coiled blank defining a longitudinal gap,

b. transferring the coiled blank to an end conditioning press while positioning the longitudinal edges of the blank at predetermined circumferential positions so that said gap has a preselected width and circumferential location as it enters said press;

c. flattening the longitudinal edge portions of the coiled blank in the end conditioning press;

d. simultaneously (1) transferring the end conditioned blank to a welding station while maintaining said gap at said predetermined circumferential location, (2) transferring another coiled blank to the end conditioning press, and (3) loading another blank of strip material into the coiler;

e. butt welding the longitudinal edge portions of the coiled blank at the welding station; and

f. simultaneously (1) transferring the welded blank away from the welding station while maintaining the weld at a predetermined circumferential position, (2) transferring another end conditioned blank to the welding station, (3) transferring another coiled blank to the end conditioning press, and (4) loading another blank of strip material into the coiler.

3,934,325

FASTENING METHOD, APPARATUS AND ARTICLE

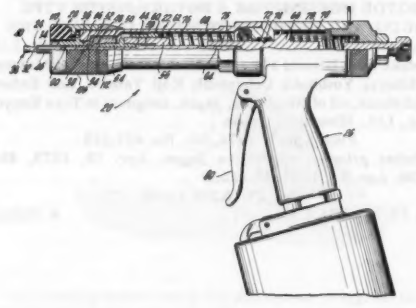
David M. Jaffe, Guilford, Conn., assignor to Automatic Fastener Corporation, Branford, Conn.

Filed May 10, 1974, Ser. No. 468,990

Claims priority, application United Kingdom, May 29, 1973, 25582/73

Int. Cl.² B21J *15/06*

U.S. Cl. 29—243.52 **11 Claims**



1. Apparatus for setting blind fasteners having a front portion, a rear portion and an aperture therethrough, in a plurality of pieces of material, which comprises:

fastener setting means having an aperture therethrough and a portion adapted to engage and set a fastener,

mandrel means mounted for reciprocal movement in said aperature in the fastener setting means, said mandrel means extending out from said aperture and being adaptable to receive a fastener thereon, the mandrel means including a front portion adaptable to set the front of the fastener when driven into engagement with it,

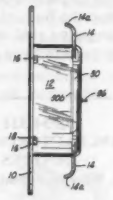
means for driving the mandrel means rearwardly to first set the front of the fastener and then to drive the fastener thereon rearwardly until the rear portion of the fastener is driven into the fastener setting means to set the rear of the fastener, and

means mounted on said fastener setting means for engaging the rearmost piece of material on the fastener and driving it forwardly on the fastener into engagement with the piece of material on the fastener in front thereof as the fastener is driven rearwardly by the mandrel means.

3,934,326
ELECTRIC METER INSTALLING DEVICE

Donald W. Owen, Norman, and Richard D. Pooler, Oklahoma City, both of Okla., assignors to Southwest Electric Company, Oklahoma City, Okla.

Filed Oct. 2, 1974, Ser. No. 511,224
Int. Cl.² B25B 27/02
U.S. Cl. 29—278 24 Claims



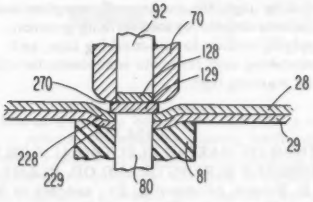
1. An electric meter installing device comprising:
a hollow transparent housing having an opening at one side thereof;
handles on opposite sides of the housing facilitating the lifting, handling and guidance of the housing;
meter engaging means within the housing at the side thereof opposite said opening and secured thereto for engaging an electric meter to be installed while a portion of the meter projects through said opening; and
releasing means accessible from outside the housing and cooperating with said meter engaging means to facilitate disengagement of an electric meter from the meter engaging means after the electric meter has been installed.

23. An electric meter installing device comprising:
a shield plate having an opening therethrough;
a hollow, open sided housing secured to said shield plate with the open side thereof aligned with the opening through said shield plate;
handle means on said housing;
a suction cup secured to the opposite side of said housing from the open side thereof; and
releasing means accessible from outside the housing for disengaging an electric meter from said suction cup.

3,934,327
METHOD OF INTERLOCKING OVERLAPPING SHEET MATERIAL

Otto P. Hafner, 1321 Paddock Way, Cherry Hill, N.J. 08034

Continuation-in-part of Ser. No. 497,884, Aug. 16, 1974, Pat. No. 3,885,299, which is a division of Ser. No. 384,494, Aug. 1, 1973, Pat. No. 3,862,485. This application Mar. 21, 1975, Ser. No. 560,786. The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Int. Cl.² B23P 11/00, 17/00
U.S. Cl. 29—432 2 Claims



1. A method of locking together overlying sheets of metal or other material having deformable properties and including first and second sheets having interior and opposed exterior surfaces; said method comprising:

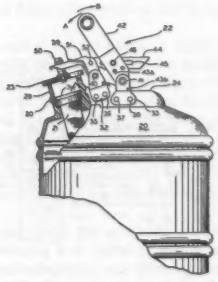
a. piercing said overlying sheets discontinuously along a boundary line defining a minor area;
b. displacing in one direction the material of said first and second sheets within said minor area out of the respective planes of the non-displaced first and second sheet major-area sheet material and bending in the opposite direction the edge portions of the major-area sheet material adjacent the piercings therein, the extend of said displacement of said minor-area material being such that the exterior surface of the minor-area material of the first sheet is just beyond the exterior surface of the bent edge portion of the second sheet material; and
c. compressing together the displaced minor-area material of said first and second sheets while confining the displaced minor-area material of the second sheet to limit its outward spread and to spread outwardly the displaced minor-area material of the first sheet over the exterior surface of the bent edge portion of the second sheet material beyond the edges of the piercings therein.

2. Apparatus for locking together overlying sheets of metal or other material having deformable properties and including first and second sheets having interior and opposed exterior surfaces; and apparatus comprising:
a. means for piercing said overlying sheets discontinuosuly along a boundary line defining a minor area;
b. means for displacing in one direction the material of said first and second sheets within said minor area out of the respective planes of the non-displaced first and second sheet major-area sheet material and for bending in the opposite direction the edge portions of the major-area sheet material adjacent the piercings therein, the extent of said displacement of said minor-area material being such that the exterior surface of the minor-area material of the first sheet is just beyond the exterior surface of the bent edge portion of the second sheet material; and
c. means for compressing together the displaced minor-area material of said first and second sheets while confining the displaced minor-area material of the second sheet to limit its outward spread and to spread outwardly the displaced minor-area material of the first sheet over the exterior surface of the bent edge portion of the second sheet material beyond the edges of the piercings therein.

3,934,328
PROCESS FOR MAKING A PLASTIC WALLED DEVICE

Frank S. Flider, Chicago, Ill., assignor to Justrite Manufacturing Company, Chicago, Ill.

Division of Ser. No. 98,557, Dec. 16, 1970, abandoned. This application Feb. 26, 1973, Ser. No. 335,516
Int. Cl.² B23P 11/02
U.S. Cl. 29—453 9 Claims



1. A process for making a plastic walled device comprising:
a. forming a stock-shaped device having an outer surface and an inner surface separated by a wall of plastic,

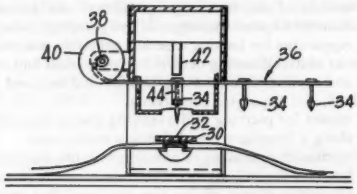
b. integrally forming on said outer surface a thickened two-sided fin portion projecting away from said outer surface.
c. placing a plate on each of the two sides of said fin, and
d. passing a fastener through each of said plates and said fin without breaking through said inner surface.

3,934,329

METHOD OF AND APPARATUS FOR ATTACHING FASTENERS FOR CLOTH AND THE LIKE

Jeff Satkin, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 10, 1974, Ser. No. 513,881
Int. Cl.² B23P *11/02*
U.S. Cl. 29—453 **2 Claims**



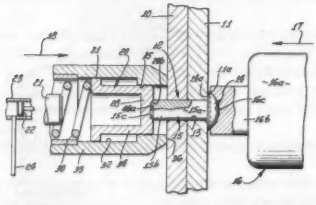
1. A method of feeding and affixing fasteners for cloth and the like which comprises: providing a plurality of first fastener members each having an aperture extending therein; providing a plurality of elongated second fastener members inserted in holes spaced apart along an elongated coiled tempered feed strip, said second elongated members each having an end dimensioned and configured for engagement with said aperture, positioning the associated cloth intermediate a free end of said strip and one of said first fastener members, supporting the coiled strip in a manner for the coil of the strip to urge the strip end to advance along the cloth, stopping the advancement of said strip end with one of said second members on said strip in coaxial relationship with the aperture, and forcing axially said second member into said aperture of said first member.

3,934,330

REVERSE END RIVETING SYSTEM AND METHOD

Franklin S. Briles, 3600 Catamaran, Corona Del Mar, Calif. 92625

Filed Mar. 28, 1974, Ser. No. 455,555
Int. Cl.² B21D *39/00*
U.S. Cl. 29—509 **16 Claims**



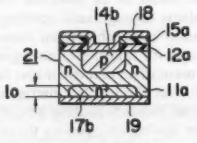
1. In the method of securing a metallic rivet to work containing a through bore, the rivet having a head at one side of the work, an axially extending shank extending through the bore, the shank having a terminal protruding at the opposite side of the work, the terminal having a tip, there being an anvil and a driver, the anvil having a recess at one side thereof shaped to interfit said tip, the steps that include
a. applying back-up force to the rivet head tending to urge the head toward the work, and interfitting said tip into said anvil recess, and
b. thereafter delivering an impact from the driver to the anvil and then to the rivet shank terminal via said tip in a direction tending to urge said terminal toward said bore, but with sufficient impact velocity as to radially expand and axially shorten the bulk of said terminal, thereby to form an upset engaging said opposite side of the work while the head remains in close adjacency to said one side of the work.

3,934,331

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Masayoshi Sugiyama, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Continuation of Ser. No. 343,033, March 20, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 537,962
Claims priority, application Japan, Mar. 21, 1972, 47-27454
Int. Cl.² B01J *17/00*
U.S. Cl. 29—583 **5 Claims**



1. A method of manufacturing semiconductor devices, comprising the steps:
a. forming a plurality of N-type high concentration regions in an N-type region whose surface is exposed to a first main surface of a semiconductor wafer, said N-type region forming at least one PN junction with an adjacent P-type region, each of said N-type high concentration regions being remote from one another;
b. forming a metal layer over the entirety of said first main surface of said N-type region to form ohmic contact with said N-type high concentration regions;
c. scribing grooves on a second main surface opposite to said main surface in a manner that said grooves in two directions are perpendicularly arranged to form substantially squares in which each of said N-type high concentration regions is confined and is smaller than the square in area so that each of said N-type high concentration regions is surrounded by the N-type region;
d. applying a masking tape to said metal layer;
e. applying a pressure to said semiconductor wafer on said masking tape for cutting off complete semiconductor elements defined by said scribing grooves;
f. applying tension to said masking tape; and
g. separating said complete semiconductor elements from said masking tape.

3,934,332

METHOD OF MAKING ELECTRICAL COILS HAVING IMPROVED STRENGTH AND OIL PERMEABILITY

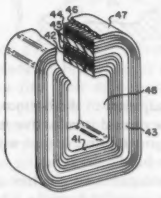
Floyd F. Trunzo, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1974, Ser. No. 527,459
Int. Cl.² H01F *41/06*
U.S. Cl. 29—605 **10 Claims**

1. A method of making an oil permeable, bonded transformer comprising the steps of:

A. continuously, uniformly coating both sides of a flexible, porous sheet material having a thickness of between about 1 to 30 mils with dry adhesive resin particles having an average particle size of between about 37 to 420 microns, said coating covering from about 5 to 50 percent of the sheet material area in a non-patterned random distribution;

B. heating the coated sheet material between about 85° to 250°C for an effective period of time, forming a discontinuous 0.25 to 7 mil dry coating of discrete adhesive particles having substantially rounded cross sections bonded to each side of the sheet material, said adhesive coating covering from about 5 to 50 percent of the sheet material area in a non-patterned random distribution, to provide a porous, oil permeable resin particle coated layer insulation;



C. winding electrical conductors into turns, to form at least two different windings including a high voltage winding and a low voltage winding and inserting the porous, oil permeable, resin particle coated layer insulation between the high voltage winding and low voltage winding and between layers of the high voltage winding and the low voltage winding, to provide a wound coil assembly;

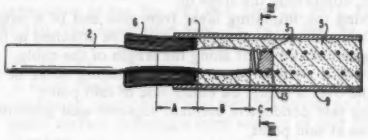
D. heating the wound coil assembly at a temperature and for a time effective to securely bond the winding layers together, while still providing an adhesive covering of the layer insulation of between about 5 to 50 percent, to provide a porous, oil permeable bonded coil assembly; and

E. impregnating the wound, bonded coil assembly with an insulating oil comprising a hydrocarbon liquid.

3,934,333
METHOD OF CONSTRUCTING BILATERAL HEATER UNIT

John W. Churchill, 12 Winthrop Ave., Beverly, Mass. 01915

Division of Ser. No. 382,295, July 25, 1973. This application Nov. 26, 1974, Ser. No. 527,186
Int. Cl.² H05B *3/00*
U.S. Cl. 29—611 **11 Claims**



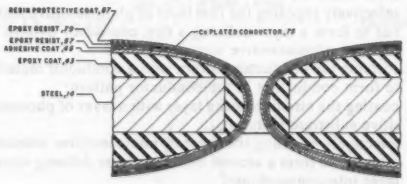
1. A method of forming a heater unit comprising the steps of forming a resistor assembly by placing each end of an elongated resistor helix over respective end portions of cylindrical metal terminals such that the helix is detachably secured to the respective terminals and extends therebetween, arranging the resistor assembly in a metal tubular sheath such that the assembly extends in the longitudinal direction of the sheath, filling the sheath with granulated powdered insulating material, capping the ends of the tubular sheath with end plugs which are sized for a slide fit into the sheath and a slide fit around the cylindrical terminals which extend through the plugs, and deforming the tubular sheath over the entire length thereof to compact the powdered insulating material such that the end plugs and the metal terminals are deformed to a shape corresponding to the shape of the sheath in the region of the end plugs and metal terminals with the end plugs and terminals becoming lockingly secured within the sheath, at least a portion of the sheath in the region of the end plugs together with at least a portion of the end plugs and the metal terminals thereat being deformed out of round.

11. A method of forming a heater unit comprising the steps of forming a resistor assembly by placing each end of an elongated resistor helix over respective end portions of cylindrical metal terminals such that the helix is detachably secured to the respective terminals and extends therebetween, arranging the resistor assembly in a metal tubular sheath such that the assembly extends in the longitudinal direction of the sheath, filling the sheath with granulated powdered insulating material, capping the ends of the tubular sheath with end plugs which are sized for a slide fit into the sheath and a slide fit around the cylindrical terminals which extend through the plugs, bending the tubular sheath having the resistor assembly and powdered insulating material therein into the shape of a U, pressing the legs of the U together while maintaining the same tube diameter, and then deforming the tubular sheath over the entire length thereof to compact the powdered insulating material and to provide a heater unit having a substantially circular cross section formed by two substantially semicircular parallel extending leg portions interconnected by a portion of the tubular sheath having a 180° outer return bend.

3,934,334
METHOD OF FABRICATING METAL PRINTED WIRING BOARDS

Stephen L. Hanni, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 15, 1974, Ser. No. 461,072
Int. Cl.² H05K *3/10*
U.S. Cl. 29—625 **11 Claims**



1. A method for fabricating printed wiring boards comprising:

a. forming a metal substrate having a circuit hole pattern;

b. electrostatically powder coating the metal substrate and hole forming walls with a suitable dielectric;

c. fusing the dielectric powder coating to electrically insulate the metal substrate including the apertures thereof from electrical circuitry; and

d. forming electrical circuitry on the dielectric in conjunction with the hole patterns.

3. A method for fabricating printed wiring boards comprising:

a. blanking sheet metal for outlining a plurality of metal substrates, forming hole patterns within said plurality of outlined metal substrates, and forming lead frames adjacent horizontally disposed edges of the sheet metal with holes therein for use in advancing the sheet metal and outlines of metal tabs;

b. preparing the sheet metal for coating with a layer of insulating material;

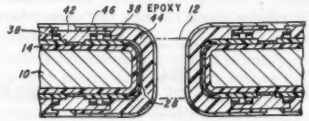
c. electrostatically powder coating surfaces of the metal substrates of the sheet metal with a dielectric;
d. fusing the coating for thermosetting the dielectric for electrically insulating the metal substrates;
e. coating all the dielectric insulating coating with an adhesive coating in preparation for forming conductor patterns and through hole interconnections by metallization;
f. forming conductor patterns on the adhesive coating;
g. partially removing the adhesive coating from the conductor patterns to form metal plating locking micropores;
h. electrolessly plating the conductor patterns with an electrically conducting material;
i. selectively forming soldering patterns;
j. removing any oxide forming on the exposed soldering patterns; and
k. sealing the exposed soldering patterns to prevent oxidation of the soldering pattern whereby a plurality of printed wiring boards are formed between a lead frame.

3,934,335

MULTILAYER PRINTED CIRCUIT BOARD

Mark A. Nelson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 16, 1974, Ser. No. 515,282
Int. Cl.² H05K *3/18, 3/28*
U.S. Cl. 29—625 **11 Claims**



1. A method for fabricating a multilayer printed wiring circuit board comprising:
a. forming a dielectric layer on a substrate;
b. coating the dielectric layer with a first layer of photosensitive material;
c. selectively exposing the first layer of photosensitive material to form a layer defining a first conductor pattern of exposed photosensitive material;
d. forming the conductor pattern with a conductor material to form conductors in the conductor pattern;
e. coating the circuit bearing layer with a layer of photosensitive substrate material;
f. selectively exposing the layer of photosensitive substrate material to form a second dielectric layer defining circuit layer interconnections;
g. coating the second dielectric layer with a second layer of photosensitive material;
h. selectively exposing the second layer of photosensitive material to form a layer defining a second circuit pattern of exposed photosensitive material;
i. forming the second conductor pattern with electrically conducting material; and
j. repeating steps e through i to form a plurality of electrically interconnected layers of circuitry.

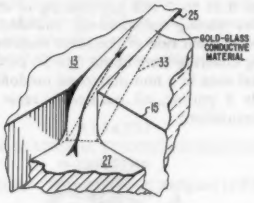
3,934,336

ELECTRONIC PACKAGE ASSEMBLY WITH CAPILLARY BRIDGING CONNECTION

Robert S. Morse, La Mesa, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 13, 1975, Ser. No. 540,579
Int. Cl.² H05K *3/10, 3/30*
U.S. Cl. 29—627 **3 Claims**

3. A method of assembling an electronic package for enclosing a microelectronic device mounted on a substrate comprising the steps of:
forming a device mounting recess in said substrate;
locating a plurality of conductive leads on said substrate;
cutting a capillary groove into the wall of said recess and leading from said recess to terminate at one of said plurality of electrically conductive leads;
applying a layer of hardenable conductive material to the bottom of said recess and to at least a portion of the wall



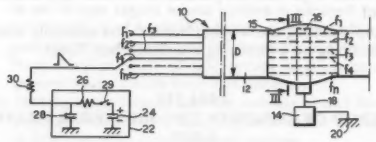
of said groove adjacent to the bottom of said recess causing upward flow of said conductive material by capillary action in said groove into contact with said one conductive lead before hardening; and
hardening said hardenable conductive material resulting in said conductive material forming a tenacious bond with said one of said plurality of electrically conductive leads.

3,934,337

METHOD OF CONNECTING A TERMINAL TO A WIRE

Mario Palazzetti, Avigliana (Turin), and Franco Grisotto, Turin, both of Italy, assignors to Fiat Societa per Azioni

Filed Aug. 15, 1974, Ser. No. 497,795
Claims priority, application Italy, Sept. 21, 1973, 69784-A/73
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **2 Claims**

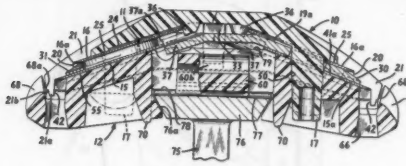


1. A method of attaching a conductive element to form a terminal to one of the wires of a cable with a plurality of wires, each wire having a conductive core covered by an insulating layer, and an outlet insulating cover holding all said wires together, comprising the steps of:
removing the insulating layer from one end of a wire to which said conductive element is to be attached to form a terminal at a point along the length of the cable,
removing a portion of said outer insulating cover of said cable over a region on either side of said point,
placing said conductive element adjacent said plurality of wires at said point,
covering said wires and said conductive element with hardenable liquid conductive material, and
applying between said conductive element and said one end of said wire to which said element is to be connected a voltage which rises until dielectric breakdown of the insulating layer around said wire occurs and then falls rapidly, said dielectric breakdown of said insulating layer causing perforation of said insulating layer and permitting said conductive liquid material to contact the conductive core of said wire, whereby upon subsequent hardening of said conductive liquid hardenable material a permanent connection of said terminal element to said wire is made.

3,934,338
MULTIPLE BLADE SAFETY RAZOR COMBINATION

Paul A. Braginetz, Augusta County, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 11, 1972, Ser. No. 313,742
Int. Cl.[2] B26B *21/06*
U.S. Cl. 30—47 **9 Claims**



1. In a combination a razor head cartridge embodying a cap member, multiple blades, a blade spacer member, and a main platform member, a first pair of opposed blades being arranged under said cap member each extending radially outwardly from the midportion of the cap member, a second pair of blades similarly arranged with the spacer member positioned between the pairs of blades, the platform member being arranged adjacent the second pair of blades, said cap member having a pair of spaced downwardly projecting lugs positioned at each side of the midportion of the cap member to limit initially the rearward position of the respective said first blade the final radial outward position of the blade being determined by shoulder stop means on the cap member, each said lugs being nested in a depression in the spacer member, each said depression providing a shoulder to limit initially the rearward position of the respective said second blade the final radial position of the blade being determined by a shoulder stop means in the cap member, and a plurality of posts clamping together the said members and blades as a rigid assembly.

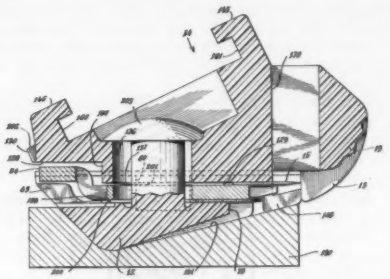
2. In a multiple blade razor having a cap member and a platform member with an intervening pair of blades in superposed relation and a spacer member between the blades and locking posts connecting the cap member and platform member and extending through openings in the spacer member and the blades, said spacer member having an annular flat reinforcing ring around each post opening of greater thickness than the adjacent main portions of the sheet, and a finger extending outwardly between the blades from each said ring and merging therewith.

3,934,339
RAZOR BLADE CARTRIDGE

Jan Dawidowicz, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 191,665, Oct. 22, 1971, Pat. No. 3,783,510. This application Sept. 21, 1973, Ser. No. 399,587
Int. Cl.[2] B26B *21/22*
U.S. Cl. 30—47 **5 Claims**

1. A razor blade cartridge comprising:
an elongated plastic blade seat member having an elongated guard surface defining a front surface of said blade seat member;
a bottom blade having an elongated cutting edge and a rear edge opposite said bottom blade cutting edge, said bottom blade being located on said blade seat member with said bottom blade cutting edge spaced upwardly and rearwardly of said guard surface;
an elongated spacer member located on said bottom blade;
a top blade having an elongated cutting edge and a rear edge opposite said top blade cutting edge, said top blade cutting edge being spaced upwardly and rearwardly of said bottom blade cutting edge;
a cap member located on said top blade including means extending downwardly from said cap member in abutting engagement with the rear edge of said top blade for preventing rearward movement;
means including a first pair of spaced stop surfaces for abutting engagement with said bottom blade cutting edge;
means including a second pair of spaced stop surfaces for abutting engagement with said top blade cutting edge;

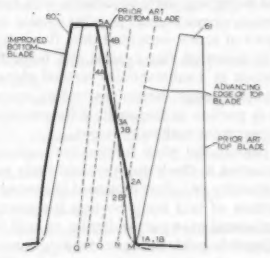


a pair of spaced elements integrally molded with and extending upwardly from said blade seat member beneath said spacer member and in abutting engagement with the rear surface of said bottom blade for preventing rearward movement of said bottom blade;
means for permanently bonding said bottom blade, said spacer member, and said top blade between said blade seat member and said cap member; and
means for releasably engaging a cartridge holder.

3,934,340
CUTTING BLADE EDGE CONSTRUCTION FOR MECHANICALLY ACTUATED SHEARS

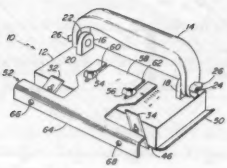
John E. Jones, and Lynn D. Lineback, both of Danville, Va., assignors to Disston, Inc., Pittsburgh, Pa.

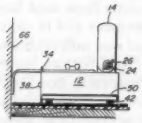
Filed Aug. 23, 1974, Ser. No. 500,140
Int. Cl.[2] B26B *19/06*
U.S. Cl. 30—220 **18 Claims**



1. A cutting apparatus comprising:
a. a mechanical drive source;
b. mounting means for said drive source; and
c. a pair of planar cutting blades having a predetermined number of coacting cutting edges for cutting material caught therebetween, said blades being mounted on said mounting means for repetitive relative movement and having a drive connection to said drive source whereby the respective coacting edges of said blades move in a repetitive angular relation and repetitively execute cutting actions, said coacting edges being shaped such that during each such cutting action the contacting cutting point between each pair of coacting edges moves at a uniform speed.

3,934,341
CARPET CUTTING TOOL
Larry A. Carlson, 64 Cheyenne Drive, Nashua, N.H. 03060
Filed Oct. 9, 1974, Ser. No. 513,317
Int. Cl.² B26B 29/00
U.S. Cl. 30—287 1 Claim





1. A tool for cutting installed carpets and the like along a line parallel to a baseboard or the like, comprising

a. a body portion having a substantially flat horizontal upper face and a substantially flat vertical front face,

b. a handle connected to the upper face ofsaid body portion and being angularly adjustable with respect to said body portion about an axis parallel to said front face,

c. a pair of screw -mounted thin, flat cutting blades detachably mounted flat against the front face of said body portion in a substantially vertical plane and each having a cutting edge thereof extending downwardly from the body portion in diagonally different directions for cutting engagement with said carpet,

d. a smooth flat plate formed with upwardly curved ends mounted to the bottom of said body portion,

e. a plurality of rollers mounted in spaced relation along the bottom of said body portion for rotation about parallel horizontal axes perpendicular to said front face,

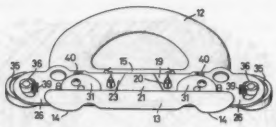
f. adjustable guide means extending from said body portion in spaced parallel relation to said cutting blades for sliding engagement with said baseboard,

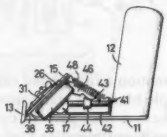
g. said guide means including a horizontally disposed flat leg portion adjustably connected to the upper face of said body portion and extending therefrom perpendicular to said front face,

h. said guide means also including a verically disposed straight, smooth, flat wall at the free end of the said leg portion and perpendicular thereto for sliding engagement with said baseboard, said wall being substantially coextensive with and parallel to said front face and formed with an opening in registration with each cutting element,

i. cooperating measuring indicia on the leg portion of said guide means and on the upper face of said body portion for measuring the spacing between the wall of said guide means and said cutting blades.

3,934,342
CARPET CUTTER
Katsumi Matsushita, No. 14-14, 1-cho Kaorigaoka, Sakai, Osaka, Japan
Filed Aug. 30, 1974, Ser. No. 501,866
Int. Cl.² B26B 29/00
U.S. Cl. 30—293 3 Claims





1. A carpet cutter, comprising in combination:

a. a horizontal base plate (11) with one and another terminal portions, said base plate being slidable along a carpet;

b. a grip (12) vertically mounted along said one terminal portion of said base plate;

c. a sidewise extending guide plate (13) disposed vertically at substantially a right angle to said base plate (11) at said other terminal portion, said guide plate (13) being substantially parallel to said grip (12), one side of said guide plate facing said grip (12), said guide plate (13) being longer than and extending outwardly from the base plate (11) at both sides thereof;

d. an oscillatable plate (15) with a lower terminal axially connected to said base plate (11) at the immediate vicinity of said guide plate (13) on said grip facing side;

e. a blade holding plate (19) with a terminal section fixed to said oscillatable plate (15) at said side facing the guide plate (13), a blade fitting plate (20) connected sidewise to said terminal section, said blade fitting plate (20) holding a blade (22) with a cutting portion to the blade holding plate (19) at said terminal section in the position of having the blade (22) overlapping, a space (38) for allowing the insertion of a carpet defined between the guide plate (13) on the grip facing side and the blade cutting portion;

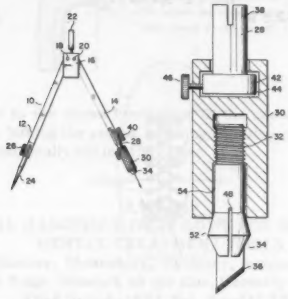
f. a wheel member (35) disposed on said blade fitting plate (20) outwards of the blade cutting portion at the grip facing side thereof, said wheel member (35) serving to press the carpet at the cutting portion thereof by rolling thereover while cutting the carpet; and,

g. a rotatable spiral shaft (43) and a spiral cylinder (44) with a link (46) disposed between the oscillatable plate (15) and the grip (12) on said base plate (11), said oscillatable plate (15) being connected to said spiral cylinder (44) by said link (46) so that the angle of said oscillatable plate (15) to said base plate (11) is adjustable.

3,934,343
DEVICE FOR CUTTING CIRCLES
Jacek Witecki, Downsview, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Oct. 30, 1974, Ser. No. 519,119
Int. Cl.² B26B 5/00; B43L 9/02
U.S. Cl. 30—310 3 Claims

1. A device for cutting circles comprising: a pair of elongated legs; pivot means connecting upper ends of said legs for swinging movements; a pointer carried in the lower end of one of said legs; blade holding means; means for mounting said blade holding means to a lower end of the other of said legs for rotation about the axis of said other leg; a pointed generally planar blade fixedly carried projecting from said blade

holding means; said blade holding means having a bore in the lower part thereof, said bore having a threaded upper portion and an unthreaded lower portion, a slitted member having slits at a lower portion thereof for fixedly carrying said blade and outwardly flaring surfaces in the area of said slits, said slitted



member further having an upper threaded portion for connection to said threaded portion of said bore, the screwing of said threaded portions together resulting in tightening said flaring surfaces against the unthreaded lower portion of said bore thereby clamping said blade in said slits.

3,934,344

PORTABLE CHAIN SAW

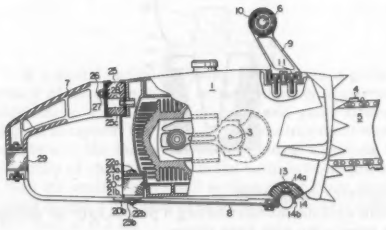
Hisashi Inaga, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,903

Claims priority, application Japan, Mar. 28, 1974, 49-33953

Int. Cl.² B23D *57/02*; B27B *17/00*

U.S. Cl. 30—381 **5 Claims**



1. A portable type chain saw having separate front and rear handles which are attached respectively to front and rear portions of the main body of the chain saw engine in a manner that mechanical vibration caused by the engine-operation may be absorbed characterized in that said front handle is attached to a front portion of the main body of the chain saw engine through vibration dampers of rubber or the like elastomeric material, said rear handle is attached to an upper rear wall of said main body through vibration dampers of rubber or the like elastomeric material; said front and rear handles are connected together by means of a rigid unitary connector extending longitudinally of said main body at the lower side thereof; said connector having a front end portion attached to a lower portion of said front handle, an intermediate portion attached to a lower rear portion of said main body through vibration damper of rubber or the like elastomeric material and a rear end portion extending rearwardly beyond said main body and attached to said rear handle through vibration damper of rubber or the like elastomeric material.

3,934,345

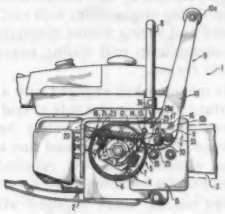
SNAP-ACTING OVER-CENTER CHAIN SAW SAFETY BRAKE AND METHOD OF OPERATION THEREOF

Sidney Hirschkoff, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Oct. 15, 1974, Ser. No. 515,046

Int. Cl.² B23D *57/02*; B27B *17/00*

U.S. Cl. 30—381 **8 Claims**



1. In a chain saw including
chain saw engine means;
chain saw cutter chain means;
chain saw driving means operable to provide a driving connection between said chain saw engine means and said chain saw cutter means, said chain saw driving means including
centrifugally responsive, clutch shoe means operable to be driven by said engine means, and
clutch drum means drivingly connected with said cutter chain means and operable to be centrifugally engaged by said clutch shoe means; and
chain saw hand grip means;
the improvement entailing a chain saw safety brake comprising:
safety handle means operable to be engaged by movement of a chain saw operator's hand away from said chain saw hand grip means;
pivot means pivotally supporting said safety handle means on said chain saw;
brake band means at least partially encircling clutch drum means and operable to be disposed in
a first, relatively expanded, brake band condition permitting movement of said clutch drum means, and
a second, relatively constricted, brake band condition engaging and substantially preventing movement of said clutch drum means;
anchor means connected with one end of said brake band means and securing said one end of said brake band means to said chain saw;
connecting means securing another end of said brake band means to a portion of said safety handle means, spaced from said pivot means, such that movement of said safety handle means away from said hand grip means and a first safety handle means position providing said first, relatively expanded brake band condition will move said connecting means relative to said anchor means and position said safety handle means at a second safety handle means position so as to constrict said brake band means and dispose said brake band means in said second, relatively constricted, condition;
biasing means comprising
first mounting means secured to one of said chain saw and said safety handle means

coil spring means engaging one end of said first mounting means,

guide rod means extending telescopingly through said coil spring means and said first mounting means, and

second mounting means biasingly engaging another end of said coil spring means and connected with said guide rod means;

over-center connecting means operably interconnecting said biasing means and said safety handle means and including

cam surface means carried by the other of said safety handle means and said chain saw and extending transversely of a radius of said safety handle pivot means on opposite sides of said radius,

cam follower means carried by said second mounting means and disposed in sliding engagement with said cam surface means, with said coil spring means biasingly urging said cam follower means into said sliding engagement with said cam surface means,

said cam follower means, when engaged with a first portion of said cam surface means on one side of said radius being operable to resiliently bias said safety handle means towards said hand grip means and said first safety handle means position, effecting said first, relatively expanded condition of said brake band means,

said cam follower means, when engaged with a second portion of said cam surface means on another side of said radius, being operable to resiliently bias said safety handle means toward said second safety handle means position effecting said second, relatively constricted condition of said brake band means,

said biasing means cooperating with said safety handle means, in said first, safety handle means position of engagement between said cam follower means and said cam surface means, to provide a relatively shorter lever arm through which said biasing means acts resiliently on said safety handle means to resiliently bias said safety handle means toward said hand grip means and said first, safety handle means position,

said biasing means cooperating with said safety handle means, in said second, safety handle means position of engagement between said cam follower means and said cam surface means, to provide a relatively longer lever arm through which said biasing means acts resiliently on said safety handle means to resiliently bias said safety handle means away from said hand grip means and toward said second, safety handle means position,

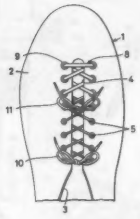
first, accelerator lever means carried by said other of said safety handle means and said chain saw, disposed on one side of said radius and said second mounting means, and operable to engage said one side of said second mounting means at a location spaced from said cam follower means, said first accelerator lever means being operable to induce movement of said cam follower means relative to said cam surface means toward said second portion of said cam surface means in response to pivoting movement of said safety handle means toward said second safety handle means position at a faster rate than would result only from direct sliding engagement of said cam follower means and said cam surface means during such pivoting movement, and

second accelerator lever means carried by said one of said safety handle means and said chain saw, disposed on another side of said radius and said second mounting means and operable to engage said other side of said second mounting means at a location spaced from said cam follower means, said second accelerator lever means being operable to induce movement of said cam follower means relative to said cam surface means toward said first portion of said cam surface means in response to pivoting movement of said safety handle means toward said first safety handle means position at a faster rate than would result only from direct engagement of said cam follower means and said cam surface means during such pivoting movement.

3,934,346
SPORTING SHOES

Kyozo Sasaki, No. 4-8, Rokuro kuso-cho, and Minoru Murayama, No. 18-203, 8-chome, Saido-cho, both of Ashiya, Hyogo, Japan

Filed Dec. 12, 1974, Ser. No. 531,853
Int. Cl.² A43B *11/00*
U.S. Cl. 36—2.5 R 3 Claims

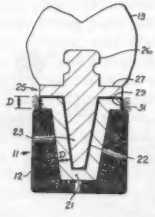


1. A shoe, including an instep with a plural number of elongated shoe strings, said strings having a middle section and being so arranged as to be tightened across said instep at a plurality of locations, and, fastening means at said middle portion combining said strings in parallel.

3,934,347
DENTAL PROSTHETIC STRUCTURE AND METHOD

Harvey Lash; Morris Kibrick, both of Palo Alto, and Shirl S. Fox, Menlo Park, all of Calif., assignors to Lash Oral Implants, Palo Alto, Calif.

Filed Jan. 14, 1975, Ser. No. 540,949
Int. Cl.² A61C *13/00*
U.S. Cl. 32—10 A 16 Claims



1. Apparatus comprising:

a hollow ceramic member having a porous exterior surface for interfacing with bone tissue;

mounting means for securing a dental prosthetic device; and

means including a resilient material disposed in the interior portion of said hollow member for suspending said mounting means in spaced-apart relation with the interior surface of said hollow member, said suspending means being resilient to multidirectional masticatory forces applied to said mounting means.

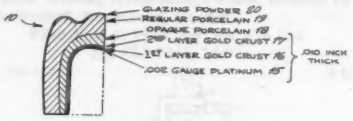
3,934,348
METHOD OF FORMING A PORCELAIN CROWN

Bora Janjic, 541 Lincoln Road, Miami Beach, Fla. 33139

Filed Jan. 2, 1975, Ser. No. 537,967
Int. Cl.³ A61C *5/08*
U.S. Cl. 32—12 6 Claims

1. A method for forming a dental crown on a crown model made from a dentist's impression, including the steps of forming male and female dies on the model in hard dental plaster, applying a 0.002 inch gauge platinum film to the male die in form fitting relation, brushing a layer of gold crust on the

platinum film, baking the crown, brushing a second layer of gold crust on the crown, baking the crown, applying a regular



porcelain to the crown conformed to the contour of the female die, baking the crown, brushing a glazing powder on the crown, and finally baking the crown.

3,934,349

DENTAL HANDPIECE OR ELBOWS FOR MOUNTING DENTAL TREATMENT TOOLS

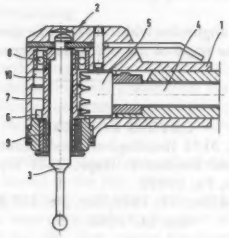
Eugen Eibofner, Mettenberg, Germany, assignor to Kaltenbach & Voigt, Biberach an der Riss, Germany

Filed Nov. 5, 1973, Ser. No. 412,722

Claims priority, application Germany, Nov. 15, 1972, 2256059

Int. Cl.² A61C *1/10*

U.S. Cl. 32—27 **4 Claims**



1. In a dental handpiece having a headpiece; a guide sleeve formed of hard metal; and means rotatably supporting said guide sleeve within said headpiece, said guide sleeve being adapted to support the shank of a dental treatment tool interiorly thereof, the improvement comprising; a coating formed essentially of chromium and metal carbide being provided on at least the annular inner wall surface of the guide sleeve, said coating having a hardness of at least 1800 Vickers hardness at a test load of 0.2 kg.

3,934,350

PHOTO CROPPING DEVICE

Larry H. Pirnie, Topeka, Kans., assignor to Josten's, Inc., Minneapolis, Minn.

Filed Aug. 22, 1974, Ser. No. 499,581

Int. Cl.² B43L *13/00*

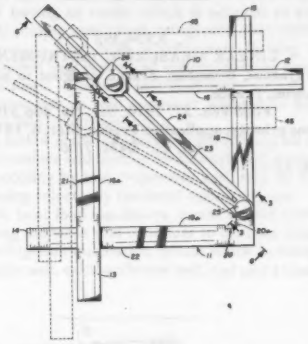
U.S. Cl. 33—94 **7 Claims**

1. A geometrical instrument for laying out and proportioning photographs and the like comprising:

a pair of angle members positioned in overlapping relationship, each of said angle members having a pair of straight edges forming an included angle of less than 180°;

a strut extending between said pair of angle members and connected with each of said angle members at a point other than the apex of said included angle such that said included angle is visually exposed, said strut permitting limited selective relative movement between said pair of angle members; and

an inset corner at the apex of each of said included angles to enable one employing the instrument to make cropping



marks which accurately reflect the specific area of the photographs and the like, framed by the instrument.

3,934,351

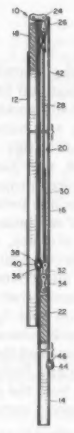
FOLDABLE MEASURING STICK

John F. Sullivan, 14734 Lassen St., Mission Hills, Calif. 91345

Filed Sept. 16, 1974, Ser. No. 506,045

Int. Cl.² G01B *3/06*

U.S. Cl. 33—105 **4 Claims**



1. A foldable measuring device comprising:

a pair of members, one of said members including a hollow chamber;

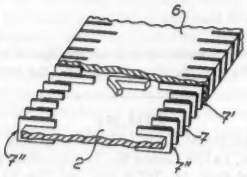
connecting means for interlocking together said first and said second members when said members are in an abutting longitudinal alignment;

first means connected to both said first and second members are located within said hollow chamber, with said members interlocked together said first means exerting a force tending to maintain said members in said interlocked relationship, said first means including elastic means to permit separating of said members and locating of such in an abutting side by side relationship; and

a locking means interconnecting said members when said members are located in said abutting side by side relationship, said locking means to retain said members in said side by side position, said elastic means cooperating with

said locking means to maintain the interconnected side by side position of said members.

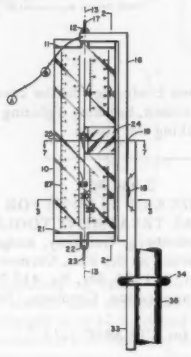
3,934,352
LINEAR MEASURING INSTRUMENT
Michel Quenot, Besancon, France, assignor to Stanley-Mabo, Besancon, France
Filed Feb. 27, 1974, Ser. No. 446,318
Claims priority, application France, Mar. 6, 1973, 73.7911
Int. Cl.² B43L 7/00
U.S. Cl. 33—111 5 Claims



1. A rigid linear measuring instrument comprising an elongated member of plastic material having a planar rectilinear core bounded by substantially parallel longitudinally extending edges and planar top and bottom surfaces, a series of graduation lines and graduating figures spaced along the longitudinal extent of said core, said planar top and bottom surfaces having lines and figures projecting outwardly in relief therefrom, each graduation line being formed by a transverse U-shaped plate, the legs of said plate forming said relief lines on said top and bottom surfaces, and the base of said U-shaped plate further projecting laterally outwardly beyond said longitudinal edge and interconnecting said legs to provide said generally U-shaped configuration, a plastic coating having a color contrasting with said figures and lines enclosing said core and having a depth substantially equal to the relief depth of said figures and lines and the lateral projection of said lines whereby said figures and lines are flush with the outer surface of said coating on both the planar surfaces and longitudinal edges of the measuring instrument.

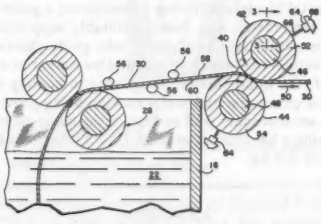
3,934,353
SURVEYING INSTRUMENT
David C. Haines, 107 "B" St., Salt Lake City, Utah 84103
Filed Sept. 19, 1974, Ser. No. 507,474
Int. Cl.² G01C 15/00
U.S. Cl. 33—262 6 Claims

1. A simple surveying instrument comprising a transparent plate; means for suspending the transparent plate from a point on a vertical axis through the center of gravity of said plate; a hairline extending across said plate and being perpendicular to said vertical axis; and a mirrored surface positioned on said plate so that the plane of the mirrored surface is parallel to said vertical axis, said hairline extending across said mirrored surface, whereby when said plate is suspended so that a person can observe the pupil of his eye in said mirrored surface, and the reflection of his pupil is bisected by said hairline, then distant objects observed through said transparent plate which



appear to be in alignment with said hairline are located in the same level as the pupil of the eye of said person.

3,934,354
DRYING ROLLERS
Henry F. Hope, 3192 Huntingdon Road, Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2548 Wyandotte Road, Willow Grove, Pa. 19090
Filed Dec. 17, 1973, Ser. No. 425,075
Int. Cl.² F26B 3/00
U.S. Cl. 34—9 13 Claims



1. The method for removing moisture droplets from the upper and lower surfaces of a photographic plastic film characterized by an emulsion surface of high surface tension, as the wet film carrying the moisture droplets exits from processing equipment including at least one liquid bath and travels in a drying chamber between and in contact with a pair of drying rollers, the improvement which consists in

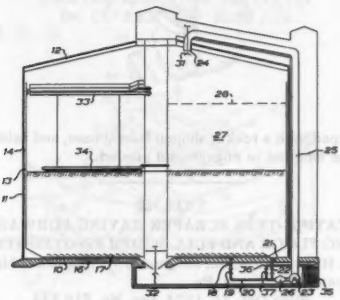
absorbing the moisture droplets by capillary action into microporous plastic material of at least a million interconnected microscopic pores per square inch covering the rollers, and

removing the dried film from contact with the rollers of the drying apparatus without leaving a droplet track on or marring the emulsion surface.

3,934,355
APPARATUS FOR STORING GRAINS AND OTHER VEGETABLE PRODUCTS

Claes Martin Weibull, Hasslehoim, Sweden, assignor to Claes Martin Weibull, Hasslehoim, Sweden

Filed June 4, 1974, Ser. No. 476,266
Int. Cl.² F26B 21/06
U.S. Cl. 34—46 6 Claims



1. A large-capacity silo for storing grains and other vegetable products, comprising

air-tight outer wall, bottom and roof,

means for charging the silo with grains to be stored therein,

means for distributing said grains in the silo,

means for withdrawing said grains from the silo,

an air conditioning unit having an outlet side for supplying to the silo air of controlled moisture content and temperature,

aeration means for causing the supplied air to flow through the grains stored in the silo,

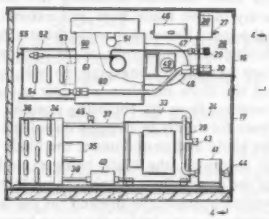
an inner wall defining with said outer wall a space which extends at least over the major part of the boundary surface of the silo, first means for connecting said air conditioning unit to said space between the silo walls,

said aeration means comprising aeration opening means located at the silo bottom and means operable independently of the first means for connecting the outlet side of the air conditioning unit to said aeration opening means.

3,934,356
TEACHING AID FOR AIR CONDITIONING APPARATUS

George W. Bryant, Houston, Tex., assignor to G. M. Brooks Industries, Inc., Houston, Tex.

Filed Oct. 10, 1972, Ser. No. 296,001
Int. Cl.² G09B 25/02
U.S. Cl. 35—13 18 Claims



1. Training apparatus, comprising:

a selectively closable portable container for simulating a volume to be air conditioned;

a refrigerant compressor unit having a refrigerant inlet and outlet;

a condenser unit connected to the outlet of said compressor unit and having an outlet which is adapted to be connected to supply condensed refrigerant, said condenser unit removing heat from a refrigerant flowing therethrough which heat is expelled remote from the simulated air conditioned volume in said container;

an evaporator unit in said container adapted to be connected to said condenser unit;

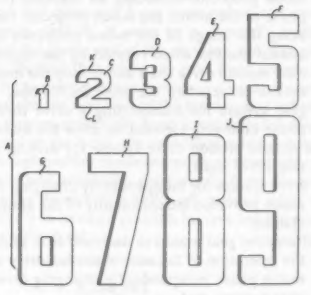
air moving means in said container for circulating air in said closed container and forcing air through said evaporator unit for cooling by said evaporator unit, said air moving means being selectively rendered operative; and,

controllable heat load simulation means in said container for heating the air in said container to alter the heat load on the refrigerant circulation system which includes said compressor unit, said condenser unit, and said evaporator unit.

3,934,357
TEACHING METHOD AND APPARATUS

Claude C. Couvillion, 3041 E. Lakeshore Drive, Baton Rouge, La. 70808

Filed Aug. 10, 1973, Ser. No. 387,350
Int. Cl.² G09B 1/02
U.S. Cl. 35—31 G 5 Claims



1. Apparatus which includes the provision for utilizing kinesthetic senses to teach arithmetic, said apparatus comprising:

a series of individual, three dimensional, digit-defining cutouts presenting a range of numerals having corresponding distinctive configurations in which each of said cutouts is of a predetermined length relative to that of the other cutouts in said series,

said cutouts being graduated to progressively increase in length from a numeral denoting a low value to a numeral denoting a high value,

the length of each of said cutouts being proportionate to that of the other cutouts in said series with the respective lengths corresponding directly with the numerical value thereof such that a selected group of two or more of said cutouts have a combined length, when placed in an end-to-end relationship, equal to that of the cutout presenting the numeral having a value equal to the sum of the values of said selected group of cutouts,

said cutouts each being provided with top and bottom edges that are straight and in parallelism with each other in order that the accurate placing of said cutouts in said end-to-end relationship is facilitated.

3,934,358

DRIVE APPARATUS FOR INDEPENDENTLY CHANGING THE PHASE OF THE MOON FOR PLANETARIUM

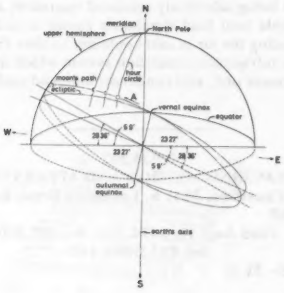
Naohiko Kitano; Katsumi Haseda, and Tamotsu Takahashi, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 15, 1974, Ser. No. 524,298

Claims priority, application Japan, Nov. 26, 1973, 48-133302

Int. Cl.² G09B 27/00

U.S. Cl. 35—42.5 2 Claims



1. A planetarium apparatus comprising:

a moon projector including an element for changing the phase of the moon, the moon projector being operable to bring the image of the moon projected on a dome into annual motion when rotated by the operation of an annual motion drive shaft and to stop the image of the moon on the dome when the drive shaft stops,

a gear system for transmitting a drive force to the moon phase changing element to drive the element,

an annual motion drive system for driving the annual motion drive shaft,

a drive system for independently changing the phase of the moon provided independently of the annual motion drive system,

differential gear means so disposed as to selectively transmit the operation of the annual motion drive system or of the moon phase independently changing drive system to the gear system, and

switching means for selectively operating the annual motion drive system or the moon phase independently changing drive system.

3,934,359

REINFORCING ELEMENTS FOR SHOE SOLES AND HEELS

John Fletcher, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 19, 1974, Ser. No. 498,436

Int. Cl.² A43B 13/22

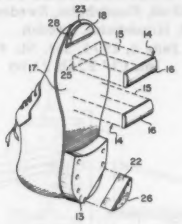
U.S. Cl. 36—73 7 Claims

1. A plurality of reinforcing elements adapted to be affixed to a sole and a heel of a shoe for providing protection to said sole and heel, and providing a means for walking easily in a soft area, which comprises:

a. a toe positioned sole reinforcement element affixed onto a toe portion of said sole;

b. a heel reinforcing element fitted into a cut out segment of said heel

c. a pair of center sole reinforcing elements, one of said pair of said center sole reinforcing elements mounted transversely across said sole just forwardly of a bend area of said sole, the other of said pair of said center sole reinforcing elements mounted transversely across said sole just rearwardly of said bend area of said sole, each said center sole reinforcing element having a rectangular box



shaped with a rocker shaped lateral base, and said lateral base adapted to engage said ground.

3,934,360

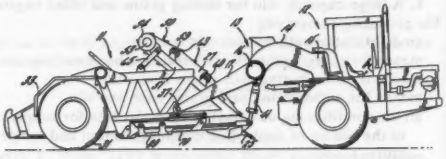
ELEVATING-TYPE SCRAPER HAVING FORWARDLY SLIDING FLOOR AND FULL-WIDTH PIVOTED STRIKER

John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Oct. 31, 1974, Ser. No. 519,534

Int. Cl.² E02F 3/85

U.S. Cl. 37—8 13 Claims



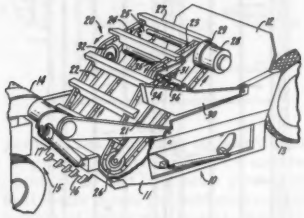
1. In an elevating-type scraper for earth moving purposes, the combination comprising an open-fronted bowl formed of a pair of spaced vertical side sheets and a fixed back wall, ground wheels for supporting the bowl and mounted behind the back wall, a scraper blade having a blade base of triangular section extensive in the fore-and-aft direction with a generally horizontal underside, the blade base extending transversely between the side sheets at the front edge thereof and rigidly secured at its ends to the side sheets for bracing the same with respect to one another, a tractor-supported draft frame, a pair of draft members pivotally secured at their rear ends to the side sheets and extending forwardly and upwardly for rigid connection at their front ends to the draft frame, actuator means coupled to the front end of the bowl for supporting it at a predetermined level with respect to the draft frame so that the blade cuts into the ground, a driven endless elevator positioned at the front end of the bowl having its lower end in proximity to the blade and inclined upwardly and rearwardly for conveying loosened soil from the blade into the bowl, a movable floor member enclosing the bottom of the bowl rearwardly of the blade base and extending transversely to bridge the space between the side sheets, the side sheets of the bowl having horizontal rails, suspension means on the movable floor member for engaging the rails for horizontal movement of the floor member, actuator means for moving the floor member from its enclosing position at the rear of the blade base forwardly to an open out-of-the way position adjacent the blade and nested under the blade base in substantial register therewith, the blade being extended downwardly in front of the nested floor member to protect the same, a strike-off member horizontally pivoted on the bowl and extending transversely so as to bridge the space between the side sheets to the rear of the floor member, the strike-off member having a striker blade at the forward edge thereof and pivoted for movement between a horizontal enclosing position and a generally vertical striking position, and means for moving the

strike-off member to its horizontal position incident to movement of the floor member to its enclosing position.

3,934,361
IDLER CONSTRUCTION FOR EARTH-MOVING ELEVATOR

Clifford E. Johnson, Peoria; Dale O. Freeburg, East Peoria, and John H. Hyler, Peoria, all of Ill., assignors to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Oct. 7, 1974, Ser. No. 512,729
Int. Cl.² E02F *3/62*; **B60P** *1/36*
U.S. Cl. 37—8 **1 Claim**



1. In an earth moving elevator for use with an open-fronted, tractor-drawn scraper bowl having

a frame including a pair of frame members which extend upwardly and rearwardly at the front of the bowl, and which have means at the upper end for pivoting to the bowl,

a pair of endless chains consisting of straight links pinned together and carrying transversely arranged flights, the chains having drive sprockets at the upper end of the frame and trained about rollers at the lower end of the frame so that the flights sweep the soil loosened by the blade backwardly into the bowl,

a pair of chain idler wheels mounted upon the respective frame members intermediate the ends thereof, the idler wheels being generally coaxial and aligned with the respective chains for supporting the latter in paths of return movement spaced from the frame members,

and means for pressing the idler wheels outwardly with respect to the frame,

the improvement whereby relatively small idler wheels, having a radius approximately equal to the distance between chain link pin centers, are employed while minimizing noise resulting from the hammering action of successive links of the chain against surfaces of the idler wheels and while minimizing the resulting wear of said chain and said idler wheels,

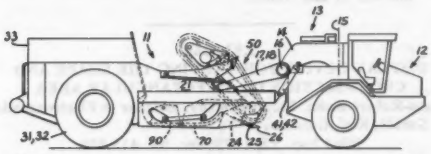
consisting of each of the chain idler wheels having an endless, relatively thick and cylindrically surfaced rim of durable material having a durometer rating in the region of 75 to 95 on the A scale.

3,934,362
ELEVATING-TYPE SCRAPER HAVING FORWARDLY SWINGABLE FLOOR SECTION

John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Nov. 15, 1974, Ser. No. 523,968
Int. Cl.² B60P *1/36*
U.S. Cl. 37—8 **23 Claims**

1. In an elevating type scraper for earthmoving purposes, the combination comprising an open-fronted bowl formed of a pair of spaced vertical side sheets and a fixed back wall, ground wheels for supporting the bowl and mounted behind the back wall, a scraper blade extending between the side sheets at the front edge thereof, a tractor-supported draft frame, a pair of draft members pivotally secured at their rear ends to the side sheets and extending forwardly and upwardly having rigid connection at their front ends to the draft frame, means including an actuator interposed between the draft frame and the front end of the bowl and having control means for determining the degree of tilt of the bowl about its supporting wheels and hence the depth of cut of the blade, a driven endless elevator positioned at the front end of the bowl having its lower end in proximity to the blade and inclined upwardly and rearwardly for conveying loosened soil from the blade into the bowl, a front floor member and a rear floor member, the members being arranged edge to edge for enclosing the bottom of the bowl between the blade and the rear wall, with each of the floor members extending transversely so as to bridge the space between the side sheets, each of the floor members being in the form of a cradle having a pair of side plates secured to the lateral ends thereof and arranged flatly adjacent and within the respective side sheets, front and rear

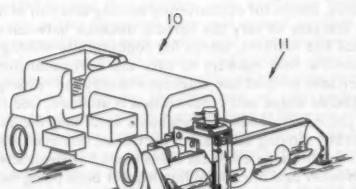


means for pivoting the side plates to the side sheets so that each floor member is pendulously supported for fore-and-aft swinging movement about a transversely extending axis, actuator means coupled to the floor members for moving them between closed and open positions, the front pivot means being so located that when the front floor member is swung forwardly to open position it nests in a generally vertical position adjacent the lower end of the elevator, the rear pivot means being so located that when the rear floor member is swung rearwardly to open position it nests in a generally vertical position adjacent the rear wall of the bowl so that substantially the entire bottom area of the bowl is available for dumping of the material in the bowl, the rear floor member having an associated straight striker blade extending substantially the width of the bowl and projecting downwardly from the bowl along the rear edge thereof to a strike-off position when the rear floor member is in its open position for leveling the material dumped from the bowl.

3,934,363
TRENCH BACK FILLING AND COMPACTING APPARATUS

Russell L. McMurray, R.R. No. 2, Du Quoin, Ill. 62832

Filed Aug. 30, 1974, Ser. No. 502,004
Int. Cl.² E02F *5/04*, *5/22*
U.S. Cl. 37—82 **7 Claims**



1. An apparatus for forcing dirt along opposite sides of a trench into the trench and then compacting the dirt within the trench comprising:

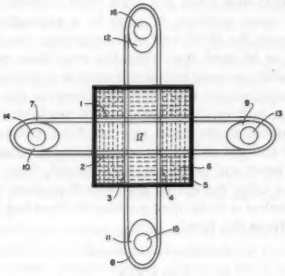
a frame;
a vertical auger rotatably mounted on said frame;
a horizontal auger rotatably mounted to said frame and including a first flight spiraling toward said vertical auger and a second flight spiraling toward said vertical auger from a side of said vertical auger opposite said first flight to propel dirt from opposite sides of said trench toward said vertical auger, said frame including a back-up wall positioned adjacent said horizontal auger forcing dirt into said horizontal auger, said frame further including another wall positioned adjacent said vertical auger forcing dirt into said vertical auger;
first means connected to said vertical auger and said horizontal auger operable to rotate said horizontal auger propelling dirt into said trench and to rotate said vertical auger to compact dirt within said trench;
second means connected to said frame and said vertical auger operable to raise and lower said vertical auger into and out of said trench.

3,934,364

DISPLAY DEVICE FOR VARYING THE SHAPE AND CROSS-SECTION OF A RECTANGULAR AREA

Hans-Robert Kuhn, Kiel, Germany, assignor to Electroacustic GmbH, Kiel, Germany

Filed Nov. 12, 1973, Ser. No. 415,020
Claims priority, application Germany, Nov. 15, 1972, 2255904
Int. Cl.² G09F 11/00
U.S. Cl. 40—28 R **3 Claims**



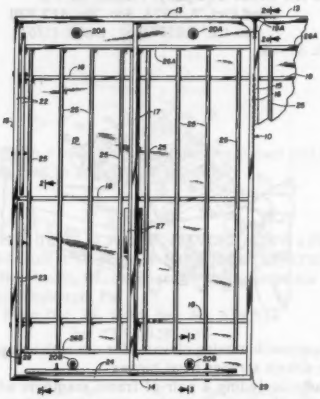
1. A display device having a centrally disposed rectangular area of variable shape and cross-section, a pair of movable line markers defining the upper and lower horizontal boundaries of said rectangular area, another pair of movable line markers defining the right and left vertical boundaries of said rectangular area, means for concurrently moving said pair of horizontal line markers to vary the vertical distance between said horizontal line markers, means for concurrently moving said pair of vertical line markers to vary the horizontal distance between said vertical line markers whereby the rectangular area of desired shape and cross-section is attained, said line markers comprising endless stretchable belts said means for concurrently moving said pair of horizontal line markers comprising two rotatable elliptical cams placed horizontally opposite each other said horizontal line marker belts being mounted on said horizontally displaced cams whereby rotation of said horizontally displaced cams induces variation in vertical distance between said horizontal line markers, and said means for moving said pair of vertical line marker belts comprising two rotatable elliptical cams placed vertically opposite each other said vertical line marker belts being mounted on said vertically displaced cams whereby rotation of said vertically displacing cams induces variation in horizontal distance between said vertical line markers.

3,934,365

SIGN FRAME

Clinton L. Stein, and Dennis D. Holien, both of Watertown, S. Dak., assignors to Esco, Inc., Watertown, S. Dak.

Continuation-in-part of Ser. No. 334,631, Feb. 22, 1973, abandoned. This application June 17, 1974, Ser. No. 479,813
Int. Cl.² G09F 7/00
U.S. Cl. 40—125 G **14 Claims**



1. A relatively large scale sign comprising:
a sign frame having a plurality of edges and being comprised of a plurality of sign frame modules connected together to form said sign frame;
a single flexible facing material having a shape and dimensions approximately that of said sign frame extending over said plurality of frame modules and covering at least one face of said sign frame, said facing material being supported by said sign frame about its periphery and having an edge corresponding to each edge of said sign frame;
a facing material gripping means connected with each edge of said sign frame for gripping the corresponding edge of said facing material, the position of at least two of said gripping means being adjustable relative to said frame to tension said facing material; and
means for adjusting the position of said adjustable gripping means relative to said sign frame for tensioning said facing material.

3,934,366

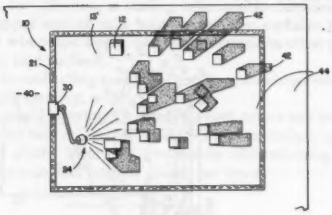
SYSTEM FOR PRODUCING VARIABLE STATIC LIGHT DISPLAYS

Robert Reiser, 9014 Melrose, Los Angeles, Calif. 90069

Filed Mar. 6, 1974, Ser. No. 448,540
Int. Cl.² G09F 13/00
U.S. Cl. 40—130 B **11 Claims**

1. A system for producing a variety of different static light displays comprising:
a plurality of three-dimensional colored image-producing elements comprised of planar surfaces;
a base having an image-surface;
means for removably holding said image-producing elements in a plurality of different stationary positions against said base surface in a manner limiting movement of said elements along said base surface, said image-producing elements extending outwardly from said base surface, said image-producing elements each having at least a colored, translucent portion which defines a generally planar exterior surface, said portions being spaced from said base surface and colored other than black or white; and

a single light source means associated with and positioned relative to said image-producing elements and said base surface so as to project a diverging beam of light, portions of said beam passing directly from the single light source means, striking said planar exterior surfaces of said translucent colored portions of the elements, passing through



said portions, and continuing on to strike said base surface to produce colored images on said base surface, other portions of said light beam passing directly from said light source means past said elements for a substantial distance to either side of said elements to directly strike said base surface.

3,934,367

EXCHANGEABLE FRAME FOR TRANSPARENCIES

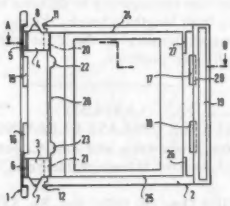
Otto Max Philipp, Eichenstrasse 15, D-8900 Augsburg-Haunstetten, Germany

Filed Mar. 21, 1974, Ser. No. 453,514

Claims priority, application Germany, Mar. 30, 1973, 2316010

Int. Cl.² G09F 1/12

U.S. Cl. 40—152 **6 Claims**



1. A frame for transparencies, comprising:

a monolithic top frame means, bottom frame means and a connecting plate means therebetween;

first and second hinge means for permitting a relative pivoting between said connecting plate means, said bottom frame means and said top frame means;

first fastening means for fastening said connecting plate means in a parallel relationship to said top frame means to prevent a relative pivoting between said top frame means and said connecting plate means about said first hinge means; and

second fastening means coaxial with said second hinge means for additionally fastening said connecting plate means to said top frame means and permitting a relative pivoting between said connecting plate means and said bottom frame means whereby when said connecting plate means is fastened to said top frame means by said first and second fastening means, said connecting plate means and said top frame means will move as a unit relative to said bottom frame means about the axis of said second hinge means and

releasable locking means for locking said top frame means in a parallel relationship to said bottom frame means, said locking means being located along an edge of said parallel connected top and bottom frame means which is parallel to said axis of said second hinge means but remote therefrom.

3,934,368

MARKING TAG

Donald David Fearing, 808 E. Geranium, St. Paul, Minn. 55106

Continuation-in-part of Ser. No. 216,489, Jan. 10, 1972, abandoned. This application May 22, 1974, Ser. No. 472,085

Int. Cl.² G09F 3/04

U.S. Cl. 40—301 **1 Claim**

1. A unitary livestock identification ear tag which can be readily folded from a normal configuration to a compact configuration for insertion into an animal's ear, following which it resiliently returns to said normal configuration for effective retention into place, said tag comprising an elongated flat body portion adapted to receive identification indicia, a neck section resiliently hinged along one of its edges to an edge of said body portion with said one edge defining a first transverse junction, said neck section extending substantially perpendicular to said body portion in said normal configuration, said neck section being thin and substantially flat in cross-section and being of a length sufficient, but not greatly exceeding, the length necessary to accommodate the thickness of an animal's ear, an elongated anchoring head substantially concave-convex from end to end and substantially equal in width to said neck section resiliently hinged intermediate the opposed ends of said anchoring head to the other edge of said neck section along a secod transverse junction substantially parallel to said first junction, said anchoring head extending only in two directions from said second junction substantially normal to said neck section and substantially parallel to said body portion in said normal configuration, the convex side of said head having a smaller radius of curvature than the opposite surface, whereby the thickness of said anchoring head is greater at said second junction than at the ends of said head, said anchoring head having opposed ends which are rounded sufficiently to engage an animal's ear to prevent unnecessary abuse of the ear during the use of the tag, said neck section being bendable along said first and second transverse junctions to position said neck into substantially coplanar relation to said body portion, and to position one end of said anchoring head substantially parallel to and substantially contacting said neck section and the other end of said anchoring head outwardly beyond said neck section with said other end of said anchoring head substantially in the plane of said neck section, whereby said neck section and said anchoring head are folded into a compact configuration for insertion through a slit in an animal's ear.

3,934,369

VITRO NET BIOXYNTHESIS OF CHLOROPHYLL AND GRANA

Constantin Anis Rebeiz, Champaign, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Apr. 23, 1974, Ser. No. 463,353
Int. Cl.² A01G 1/00
U.S. Cl. 47—58 17 Claims

1. A process for in vitro net biosynthesis of chlorophyll and grana, said process comprising the following steps in relative sequence:

a. irradiating etiolated plant tissue with visible light to precipitate formation of developing chloroplasts in said etiolated tissue;

b. homogenizing said tissue in an environment having available oxygen and in a buffer comprising biosynthetic cofactors including, coenzyme A, glutathione, potassium, inoganic phosphate, methyl alcohol, magnesium, nicotinamide adenine dinucleotide and adenosine triphosphate, which buffer has a pH of from 7.9 to 8.2, as measured at ambient temperature;

c. isolating developing chloroplasts from the homogenate of step (b); and

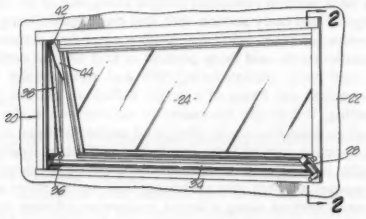
d. incubating, while irradiating with visible light, said developing chloroplasts in an environment having available oxygen and in a buffer comprising biosynthetic cofactors including, δ-aminolevulinic acid, coenzyme A, glutathione, potassium, inorganic phosphate, methyl alcohol, magnesium nicotinamide adenine dinucleotide and adenosine triphosphate, which buffer has a pH of from 7.6 to 7.8, as measured at ambient temperture, to produce chlorophyll and grana.

3,934,370

PANEL OPERATING MECHANISM

Gerald A. Kwan, Pasadena; Walter V. Penkov, Glendale, and Norman E. Roe, Sierre Madre, all of Calif., assignors to Hehr International Inc., Los Angeles, Calif.

Filed Jan. 21, 1974, Ser. No. 434,898
Int. Cl.² E05F 11/22
U.S. Cl. 49—341 10 Claims



1. an oscillation-resistant movable closure assembly comprising:

an elongated rod mounted for rotation about its axis of elongation;

a closure panel mounted adjacent a supporting frame for movement between predetermined open and closed positions relative to said frame upon rotation of said rod;

an operator mechanism coupled via gearing means to one end of said rod for rotating said rod thereby to effect said movement of said panel, said gearing means having backlash therein which could permit undesired partial movement of said panel, when said rod is operated or when external forces, other than forces exerted by said operator mechanism, are imposed on said panel, and

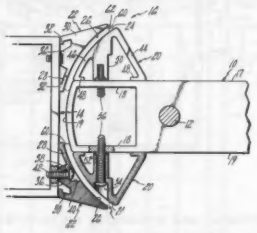
a stationary friction pad in pressure engagement with said rod at a location displaced from said one end of said rod for resisting said undesired partial movement of said panel.

3,934,371

FINGER GUARD FOR PIVOT HUNG DOOR

Henry J. Ulatowski, Southington, and William H. Flaherty, Jr., Bristol, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Apr. 7, 1975, Ser. No. 565,645
Int. Cl.² E05D 11/00
U.S. Cl. 49—383 7 Claims



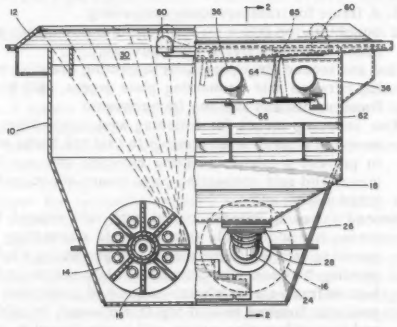
1. A standard center-pivot door pivotally mounted adjacent a jamb having a stile with opposite parallel sides and a finger guard assembly suited for field retrofit assembly to the door and to the jamb, said finger guard assembly comprising a pair of elongated jamb guard members each having a supporting surface flush mounted on the surface of the jamb facing the doorway and in spaced parallel relationship with each other, each of said jamb guard member having an exposed surface extending along its length facing the axis of the door pivot, a pair of elongated door guard members each having a supporting surface flush mounted on said opposite parallel sides of said door stile, each said door guard member having a surface respectively facing one of said exposed surfaces of one of said jamb guard members, mounting means for mounting each of said jamb guard members and said door guard members on the jamb and door stile respectively to define a narrow gap therebetween along their lengths whereby the gap remains substantially the same dimension as the door swings from its full closed to a full open position.

3,934,372

PORTABLE UPBLAST CLEANING HEAD

Philip H. Diehn, Mishawaka, and John C. Bergh, Elkhart, both of Ind., assignors to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Filed Oct. 10, 1974, Ser. No. 513,633
Int. Cl.² B24C 3/06
U.S. Cl. 51—8 SR 18 Claims



1. A portable upblast cleaning head for treating the underside of horizontally disposed surfaces comprising:

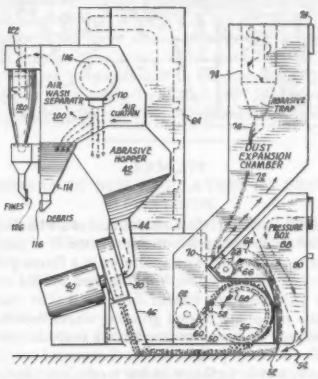
a. a housing open at its upper end and defining a generally vertical corridor;
b. at least one means mounted in the lower end of said housing for projecting particulate matter at high velocity toward said open upper end through said vertical corridor;
c. hopper means for supplying particulate to said projecting means;
d. means for effecting a sealing relationship between the open upper end of said housing and the surfaces being treated when said upper end is maintained in close proximity to said surface;
e. means for collecting spent particulate and debris resulting from said treating; and
f. means in said housing for receiving said debris and particulate from said collecting means for substantially separating said debris from said particulate and returning said particulate to said hopper means for reuse.

3,934,373

PORTABLE SURFACE TREATING APPARATUS

Raymond M. Leliaert, South Bend, and Clyde A. Snyder, Mishawaka, both of Ind., assignors to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Filed Aug. 16, 1974, Ser. No. 497,885
Int. Cl.² B24C *3/06, 9/00*
U.S. Cl. 51—9 M **13 Claims**



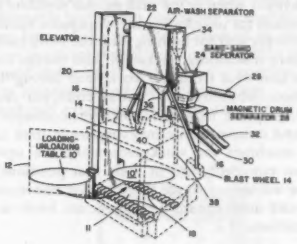
1. In a portable apparatus having means for projecting particulate material onto a surface portions of which may be grooved and for removal of debris and spent particulate thereon, the improvement comprising:
a. magnetic means for removing ferromagnetic material from said surface;
b. second means for removing by vacuum pickup any remaining debris and particulate from said surface;
c. separating means receiving the removed material from said first and second means for effecting separation of debris from said particulate;
d. means for returning the recovered and separated particulate to said projecting means; and
e. means for producing an air blast on said surface to focus the debris and spent particulate into the vicinity of said magnetic means and second means.

3,934,374

SAND RECLAMATION SYSTEM

Raymond M. Leliaert, South Bend, Ind., assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Filed Aug. 21, 1974, Ser. No. 499,312
Int. Cl.² B24C *3/14, 7/00*
U.S. Cl. 51—9 R **6 Claims**



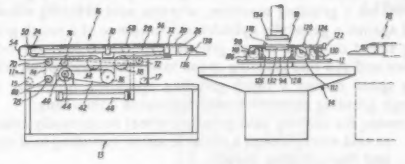
1. A sand reclamation system for breaking sand molds into discrete particles for reuse and for maintaining a selected minimum particle size, comprising:
a. a blast chamber receiving said molds for confining the blast therein;
b. means for throwing particulate at said molds to break them down into discrete particles;
c. means for conveying the spent particulate and sand particles from said blast chamber;
d. a first air wash separator for separating said sand particles from said particulate; and
e. a second air wash separator for separating sand particles to remove particles which are smaller than said selected minimum size, said second separator including counterweight means for maintaining a minimum flow rate through said separator and bypass means for returning excessive amounts of sand to said blast chamber to limit the flow rate of sand into said second separator, thereby to obtain a relatively constant volume of sand particles through said second separator to obtain precise separation of said particles by size.

3,934,375

ARRANGEMENT FOR AUTOMATICALLY LOADING AND UNLOADING A MACHINING APPARATUS

Maurice Hornstein, St. Cloud, France, assignor to Intercontinental Trading Company, Puteaux, France

Filed Dec. 24, 1974, Ser. No. 536,193
Claims priority, application France, Oct. 11, 1974, 74.34259
Int. Cl.² B24B *17/02*
U.S. Cl. 51—101 R **12 Claims**



1. The combination comprising a machining table provided with means for machining a workpiece thereon, and an arrangement for delivering the workpiece to the table and for removing the machined workpiece therefrom, the combination comprising a central, non-driven conveyor fixedly mounted on the table; a first frame separate from the table and situated upstream thereof and in line with the central conveyor; an upstream conveyor mounted on the first frame; a

second frame separate from the table and situated downstream thereof and in line with the central conveyor; a downstream conveyor mounted on the second frame; means for horizontally displacing the upstream and downstream conveyors between a first position where they are both remote from the central conveyor and second position where they are both adjacent the central conveyor; drive connection means for enabling the upstream and downstream conveyors to drive the central conveyor when in the said second position; retractable retaining means for positioning the workpiece received on the central conveyor and for holding it on the work table throughout the entire machining operation; and means for lowering the central conveyor from the workpiece during the machining operation; whereby the central conveyor receives and retains a workpiece from the upstream conveyor when the upstream and downstream conveyors are in their said second positions, machines the workpiece while the upstream and downstream conveyors are in their first positions, and then delivers the workpiece to the downstream conveyor when the upstream and downstream conveyors are back in their said second positions.

3,934,376

APPARATUS FOR CONTROLLING THE OPERATION OF A GRINDING WHEEL

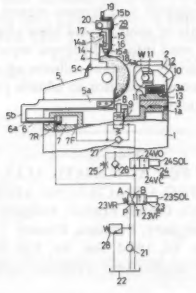
Tuyoshi Tamesui, Okazaki, and Tetsuo Matsuzaki, Nishio, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed Oct. 22, 1974, Ser. No. 516,914

Claims priority, application Japan, Oct. 29, 1973, 48-121453

Int. Cl.² B24B *49/04*

U.S. Cl. 51—165.91 **3 Claims**



1. An apparatus for controlling the operation of a grinding wheel on a grinding machine, wherein said grinding wheel is fed against a generally cylindrical workpiece at a rough grinding speed during a rough grinding operation for said workpiece and at a fine grinding speed lower than said rough grinding speed during a finish grinding operation following said rough grinding operation, said apparatus comprising:

means for moving said grinding wheel reciprocally relative to said workpiece at a variable speed including said rough and fine grinding speeds;

a device for measuring a diameter of said workpiece to generate at least first, second and third signals responsive to predetermined large, intermediate and small diameters of said workpiece during one cycle of grinding operation, said third signal indicating the end of said one cycle of grinding operation;

means for initially causing variation of said variable speed from said rough grinding speed to said fine grinding speed in response to said second signal;

means for comparing with a predetermined value an interval of time between generation of said second and third signals; and

means for causing variation of said variable speed from said rough grinding speed to said fine grinding speed in response to said second signal in a following cycle when said interval is longer than said predetermined value and for causing variation of said variable speed from said rough grinding speed to said fine grinding speed in response to said first signal in said following cycle when said interval is exceeded by said predetermined value.

3,934,377

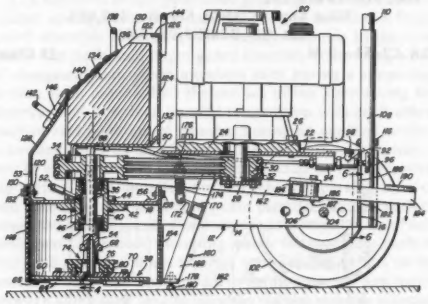
CONCRETE SURFACE GRINDER

Christian T. Tertinek, Canandaigua, N.Y., assignor to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed June 12, 1974, Ser. No. 478,728

Int. Cl.² B24B *23/02*

U.S. Cl. 51—177 **8 Claims**

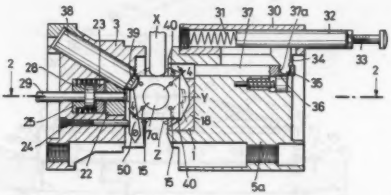


1. In a surface grinder, the combination of a wheeled undercarriage having an axle positionable in one of a plurality of longitudinally spaced pairs of apertures in a frame portion of said undercarriage, a grinding wheel carried by said undercarriage, said undercarriage further carrying a skirt means surrounding the periphery of said grinding wheel, handle means and fluid supply means extending from a rearward portion of the grinder, hollow spindle means connected to the fluid supply means and to further conduit means, said hollow spindle means mounting the grinding wheel on the undercarriage, said grinding wheel including a plurality of diamond impregnated blocks mounted on the undersurface thereof, further conduit means connecting said fluid supply means, via the hollow spindle means, with an aperture in a central portion of said grinding wheel to supply fluid thereto, a power source and drive train including belt means and sheaves for rotatably driving said grinding wheel, changeable weight means on the undercarriage to vary the pressure between the grinding wheel and the surface to be ground, a housing for the grinding wheel having a frontal portion that slants from the power source area downwardly toward the forward portion of the grinder to increase visibility for an operator, said skirt means blending with said downwardly inclined housing and surrounding said weight means, a foot-operated lever means on said undercarriage to assist an operator in elevating the grinding wheel and changing the direction in which the grinder is being moved over the surface being ground, said lever means including adjustable threaded leg elements for varying the spacing of the grinding wheel from the to-be-ground surface.

3,934,378
MECHANISM FOR MAKING ROLLER-HUB GROOVES

Heinz Ditzel, and Werner Ditzel, both of Hainstr. 29, Schoneck-Kilianstadten, Germany

Filed Sept. 12, 1974, Ser. No. 505,532
Claims priority, application Germany, Sept. 13, 1973, 2346111
Int. Cl.² B24B 41/06
U.S. Cl. 51—216 ND 8 Claims



1. A clamping and dividing mechanism for the precision machining of workpieces (1), for example annular cylinder grooves of ball races and the like, on a machine tool having a rotatable workpiece receiver (3), a counter support (5a) and a workpiece holder (5) therebetween, the mechanism comprising, in combination: means (4, 6) for guiding said holder in respective bores (2, 7) provided in said receiver and said support, in the form of two opposed swivel axles (4, 6); three parallel, resiliently guided cylinder members (19, 20, 21) in said receiver, assigned to a generated ball surface of the workpiece and aligned with a surface of the latter; an insert (18) in said support, having at least two jaws (40) facing the workpiece and engaging the same; and a trunnion (7a) associated with said holder, perpendicular to the direction of machining, and provided with support surfaces (15) for the workpiece, that are parallel with the direction of machining.

3,934,379
REMOVAL OF BUILT UP LAYERS OF ORGANIC COATINGS

Norman R. Braton, and Jan R. Acker, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sept. 3, 1974, Ser. No. 502,900
Int. Cl.² B24C 1/00
U.S. Cl. 51—319 13 Claims

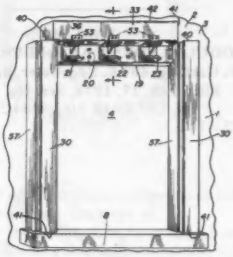
1. In the method for removing layers of organic material built up on a support for articles during surface finishing or treatment thereof, the steps of rapidly reducing the temperature of at least one of the elements including the built up layers and the support to lessen the bonded relation between the built up layers and support, and then impacting the built up layers while the built up layers are still in the refrigerated state.

3,934,380
LOADING DOCK SHELTERS

Cyril P. Frommelt, and Sylvan J. Frommelt, both of Dubuque, Iowa, assignors to Dubuque Awning & Tent Company, Dubuque, Iowa

Filed Mar. 29, 1974, Ser. No. 456,011
Int. Cl.² E06B 1/00, 7/16, 5/00
U.S. Cl. 52—173 DS 12 Claims

1. In combination with a wall having a doorway therein, a loading dock shelter comprising
   a. elongated pad means, comprising
      1. a backing member, and
      2. resilient, yieldable means mounted on said backing member and projecting outwardly therefrom, and
   b. other means supporting said pad means in position to extend along the top and sides of said doorway in said wall,
   c. said other means being mounted on said wall in outwardly projecting relation thereto,
   d. at least certain of said pad means being bodily adjustable, as a unit, inwardly and outwardly along said other means between two operative positions on said other means,
   e. said adjustable pad means projecting outwardly a greater distance from said wall when disposed in one of said operative positions than when said adjustable pad means is disposed in the other said operative position,
   f. said first mentioned pad means comprising
      1. a head pad extending along the top of said doorway, and

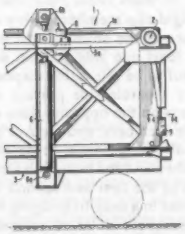


      2. two side pads extending along the sides of said doorway,
   g. said head pad and said side pads being separable from each other,
   h. said brackets having horizontally spaced elongated side members.
   i. said side members having inner and outer upwardly opening notches spaced from each other longitudinally thereof,
   j. said side pads having supporting members thereon, and
   k. said supporting members being disposed
      1. in said outer notches when said side pads are disposed in said one operative position, and
      2. in said inner notches when said side pads are disposed in said other operative position.

3,934,381
STOP LOCK ASSEMBLY FOR A PIVOTAL TOWER

Ype Bouma, Exmorra, Netherlands, assignor to General Crane Industries Limited, London, Canada

Filed Apr. 22, 1974, Ser. No. 462,941
Claims priority, application Canada, June 5, 1973, 173260
Int. Cl.² E04H 12/34
U.S. Cl. 52—116 5 Claims



1. In an erectable tower assembly wherein the base of the tower is pivotally connected to a support structure including

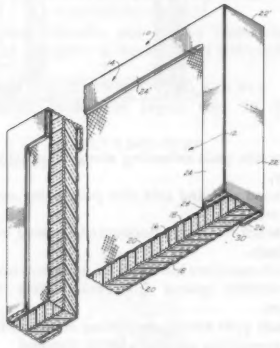
a pair of vertically positioned laterally spaced side members, said tower base adapted to be raised from a substantially horizontal stored position within substantially the vertical height of the side members wherein the tower base is disposed horizontally therebetween to a vertical operative position, and having transversely extending pins inserted in aligned bores in the tower and support structure for holding the tower in the erected position, the improvement comprising, stop means operatively connected between the support structure side members and the base of the tower operative to limit the pivotal movement of the tower to the operative position and operative to pull portions of the side members of the support structure laterally toward and into the overlying contact with the sides of the tower and against an outwardly bending force on the side members to maintain the bores in alignment for the reception of the locking pins therein.

3,934,382

MODULAR SOUND-ABSORBING SCREENS

Clifford W. Gartung, 407 E. Edgewater, Balboa, Calif. 92661

Filed Feb. 27, 1974, Ser. No. 446,127
Int. Cl.² E04B 1/82; E04C 2/38
U.S. Cl. 52—144 **14 Claims**



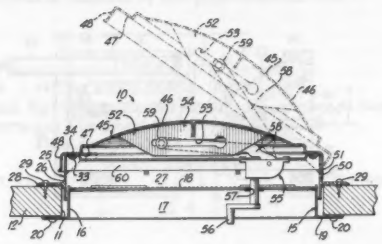
1. A modular sound-absorbing office screen system comprising a first sound-absorbing panel, a rigid first frame member surrounding a perimeter portion of the first sound-absorbing panel, a second sound-absorbing panel, a rigid second frame member surrounding a perimeter portion of the second sound-absorbing panel, each panel having a respective top edge and opposed front and rear sides, each frame member being of channel-shaped cross-sectional configuration and including a corresponding top surface overlying a corresponding top edge of each panel, and opposite front and rear side portions integral with the top surface thereof and overlying corresponding front and rear sides of each sound-absorbing panel, and means for releasably securing the first and second sound-absorbing panels together in an abutting relation to hold them in an upright position and in a desired orientation with respect to each other, the releasable securing means including a rigid clip member having a top portion to rest on the top surface of the abutting first and second frame members, and at least one side portion depending from the top portion thereof to be releasably disposed in an overlying relation against a separate side portion of each of the abutting frame members on the opposite sides of the junction between the two frame members, and a cover plate of channel-shaped cross-sectional configuration to be releasably disposed over the clip member and for being releasably held along opposite side portions of the first and second frame members to hold the clip member in a snug fit bridging the junction between the two frame members so as to releasably hold the first and second sound-absorbing panels in a fixed orientation relative to each other.

3,934,383

ROOF VENT

Loren L. Perry, Rte. 1, Alani Court, Winston Salem, N.C. 27013, and Louis J. Tuglus, 3419 N. Pontiac, Chicago, Ill. 60634

Continuation of Ser. No. 377,606, July 9, 1973, abandoned. This application July 15, 1974, Ser. No. 488,505
Int. Cl.² E04B 7/18
U.S. Cl. 52—200 **3 Claims**



1. An operating roof vent of translucent resin for mounting in a vent opening of a roof comprising; an integral cowl member including a downwardly projecting flange for cooperative insertion into said roof vent opening, an intermediate flange perimetrically surrounding said cowl member for securement to said roof adjacent the roof vent opening, and a vertically projecting outer frame portion of said cowl member extending above said perimetrical flange, a transverse beam integrally molded to said vertically projecting outer frame portion, a unitary vent cover and hinge member, said vent cover having a dished head and a perimetrical rim for cooperatively receiving said vertically projecting outer frame portion of said cowl member, said hinge member projecting from said outer rim downwardly, said hinge member being bonded to one section of said vertically projecting outer frame portion for pivotally supporting said vent cover, said vent cover having a depending control rim integrally formed in said dished vent cover in spaced juxtaposition and in alignment with said transverse beam, and means mounted on said transverse beam and connected to said depending control rib through an elongated slot in said rib for controlling the pivoting of said vent cover between closed, open and intermediate positions, said vertically projecting outer frame portion having a sealing deck, said sealing deck having a gasket receiving recess, a sealing gasket secured to said sealing deck for cooperatively sealing engagement with said vent cover in the vent cover close position.

3,934,384

CLOSURE SEAL MEMBER AND FIXED FRAME ASSEMBLY UTILIZING THE SAME

James L. Davis, St. Louis, Mo., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jan. 7, 1974, Ser. No. 431,064
Int. Cl.² A04B 1/16
U.S. Cl. 52—397 **3 Claims**

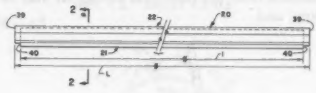
1. In a fixed frame assembly of polygonal configuration, having plural, angularly presented frame members surrounding a closure, said frame members including inner perimeter faces confronting said closure and defining contiguous perimeter recesses at one assembly face, and exposed perimeter faces at said one assembly face; said frame assembly having plural interior corners, each presented at the juncture of adjacent ones of said angularly disposed frame members; the improvement comprising:

sealing members, one presented in coextensive capping relation with each of said recesses, said sealing members including

longitudinally rigid support members frictionally retained in said capping relation by interlocking engagement with

said inner perimeter faces of said frame members, said support members including first arms extending into said perimeter recesses and second arms integral with said first arms and extending therefrom over said exposed perimeter faces of said frame members; and

sealing strips having first portions compressed between said closure and the first arms of said support members, and second portions overlying said second arms and being



substantially coextensive in area therewith, the second portions of the sealing strips of adjacent sealing members having strip ends engaged with each other and providing a neat exposed joint at each of said junctures;

the ends of the support members of adjacent ones of said sealing members being entirely spaced-apart from each other and being inwardly offset from the strip ends of the sealing strips.

3,934,385

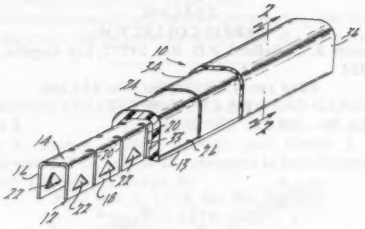
EDGE TRIM

Peter V. Paulus, Ypsilanti, Mich., and Aaron J. Ungerer, Niskayuma, N.Y., assignors to The Standard Products Co., Cleveland, Ohio

Filed Apr. 22, 1974, Ser. No. 462,623

Int. Cl.² E04C 2/33

U.S. Cl. 52—717 **2 Claims**



1. A bendable trim strip of U-section adapted to embrace and to be self-connectably located on the edge of a panel or the like comprising a U-sectioned elongated relatively flexible stiffening core formed of metal and which when bent tends to form relatively minor superficial irregularities, an elongated U-sectioned decorative covering carried by and embracing the exterior of and bendable with said core and continuously secured thereto along transversely spaced longitudinally extending narrow marginal areas located at the free edges of the legs of the U-sectioned core and covering, all portions of said covering except in said secured marginal areas being outspaced from the core throughout the entire effective length of said core and covering to define an uninterrupted longitudinal space of U-shaped cross section between the core and covering, whereby irregularities of the core are spaced from and do not affect the contour of the outspaced portion of the covering.

3,934,386

METHOD FOR MANUFACTURING OF ROOFS

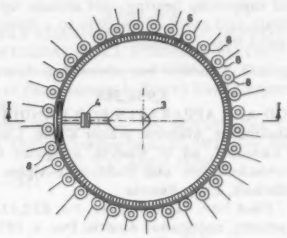
Saher Al Haj Issa, Bochum, Germany, assignor to Saher Al Haj Issa and Ali Abdulla Essa Almannai, both of Cologne, Germany

Division of Ser. No. 365,797, May 31, 1973, Pat. No. 3,866,385. This application Nov. 15, 1974, Ser. No. 523,963

Claims priority, application Germany, June 2, 1972, 2226690

Int. Cl.² E04B 1/35

U.S. Cl. 52—747 **5 Claims**



1. In a method of constructing a composite structure from a plurality of shell elements, the steps of:

positioning below the structure to be erected a set of shell elements to constitute a course in the relative side-by-side positions corresponding to those positions to be occupied by the elements in the eventual structure;

raising those edges of all the shell elements of the course which are to be lower-most in the eventual structure to the level of the upper edge of the previously erected portion of the structure;

pivotably attaching said raised edges of the shell elements of the course to said previously erected structure;

raising the edges of the shell elements of the course opposite to said previously raised edges to pivot the shell elements of the course about said pivotably attachments into their desired erected positions; and

securing the pivoted shell elements against other pivotable movement thereof.

3,934,387

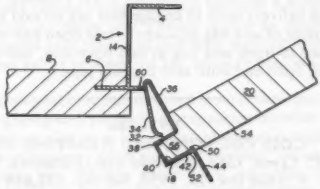
UNITARY CLIP DEVICE FOR JOINING REMOVABLE CEILING TILE TO HANGER MEMBER

Wolfgang Moeller, 4 Glen Cove Drive, Glen Head, N.Y. 11545

Division of Ser. No. 392,408, Aug. 30, 1973, Pat. No. 3,875,717. This application Oct. 21, 1974, Ser. No. 516,843

Int. Cl.² F16B 5/06

U.S. Cl. 52—760 **2 Claims**



1. A unitary clip made of a resilient material adapted to detachably hold the edge of a ceiling panel to a supporting beam, said clip comprising a body portion and a resilient catch portion, the catch portion being integral with and extending retrorsely at an acute angle from one end of a first straight section of said body portion and terminating in an arcuate tip which faces said first section, the other end of said first section terminating in a first ledge extending generally perpendicu-

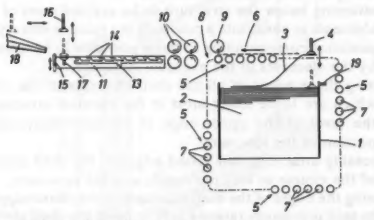
larly from said first section, under and somewhat beyond said arcuate tip, there being a small clearance between said arcuate tip and said first ledge, thereby providing for free swinging movement of said resilient catch portion; a lip member integrally connected to and extending generally perpendicularly away from the end of said ledge distal from said first section and in a direction parallel to and away from said first section, a second ledge extending from the other end of said lip generally parallel with and opposed to said first ledge, whereby the spacing between said ledges is adapted to receive an edge of a panel to be held and said arcuate tip is adapted to be deflected toward said first straight section and to springingly engage said supporting bearing, said arcuate tip serving as a cam to release said catch in response to a force applied in a direction away from said panel.

3,934,388

METHOD AND APPARATUS FOR HANDLING BAGS

Wilhelm Stadlbauer, Alkoven; Walter Kump, Linz, and Erwin Koller, Ennsdorf, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 11, 1974, Ser. No. 522,416
Claims priority, application Austria, Dec. 4, 1973, 10149/73
Int. Cl.² B65B *43/30*
U.S. Cl. 53—29 **8 Claims**



1. A method of handling a bag which is open at one end and has at least one closed edge and is initially disposed at the top of a stack of said bags, which comprises

operating a suction device to descend and engage said bag at a closed edge thereof and then to ascend so as to raise said bag adjacent to said closed edge, whereby a gap is formed between said suction device and said stack,

moving a bag support having a leading edge through said gap relative to said closed edge and transversely thereto,

holding said bag in a raised position as said support is thus moved until said bag has been entirely drawn over said leading edge,

subsequently releasing said bag and feeding it to a delivery table disposed adjacent to a bagging pipe, and

operating a plurality of suction heads disposed adjacent to said delivery table to engage said bag on said table on the outside of said bag adjacent to said open end and to move apart to open said bag at said open end, and then fitting said open end onto said bagging pipe.

3,934,389

COIN COUNTING AND WRAPPING AID

Elliott C. Cryor, 1556 Moreland Ave., Baltimore, Md. 21216

Filed Dec. 13, 1974, Ser. No. 532,689
Int. Cl.² B65B *11/04, 11/48*
U.S. Cl. 53—213 **6 Claims**

1. A coin counting and wrapping aid, comprising:

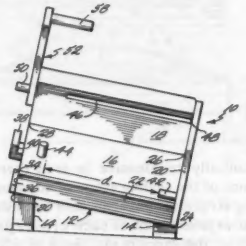
a generally rectangular, upwardly open box constituted by a floor, two opposed sidewalls and an end wall;

pedestal means mounting the box so that one sidewall is higher than the other and the floor slopes downward both toward the lower one of the sidewalls and toward said end wall;

first reference means rising from said floor a predetermined distance from the inside of said end wall, said distance equating to the width of universal coin wrappers to be used with said aid;

at least two interchangeable fourth end walls for said box, each fourth end wall including means for removably, securely mounting it on said box at the opposite end thereof from the first-described end wall so that the first described and removably end walls are a fixed distance apart;

second reference means disposed on the inside of the first-described end wall near said lower sidewall with sufficient clearance from the floor that a wrapper may be slid therebelow; and



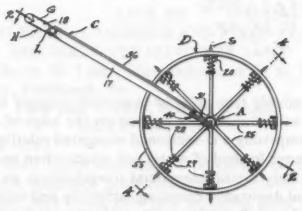
third reference means on the inside of each fourth end wall and disposed near one end thereof to generally axially align with the second reference means when the respective fourth end wall is removably mounted on the box, the third reference means each being of extents toward the second reference means, when the respective fourth walls are removably mounted on the box, such as to provide fixed distances of characteristically different length when each fourth wall is removably mounted on the box, each fixed distance being substantially the same as the length of a generally horizontal complete stack of coins of like denomination.

3,934,390

DEBRIS COLLECTOR

Alexander K. S. Ballard, P.O. Box 24772, Los Angeles, Calif. 90024

Filed Jan. 17, 1974, Ser. No. 434,266
Int. Cl.² A01D *7/10*
U.S. Cl. 56—400.02 **6 Claims**



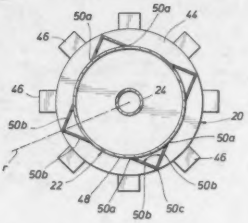
1. The debris collecting roller comprised of, a drum rotatable on axially spaced aligned pairs of spokes projecting from a tubular axle and motivating means for rolling the same over terrain from which debris is to be collected, yieldingly depressible mounting means comprised of a multiplicity of bars and each moveably guided by and between a pair of said spokes and extending longitudinally within the drum and from which gangs of spikes project through openings in and from the outside wall of the drum, and retraction means including,

an actuator axially carried on the drum axis and operable to be shifted axially by control means, and motion transfer means responsive to axial shifting of the actuator to retract the yieldingly depressible mounting means and spikes carried thereby.

3,934,391
HARVESTING TOPPER

Donald J. Brassette, Raceland, and Richard A. Duncan, Thibodaux, both of La., assignors to Thomson International Company, Thibodaux, La.

Filed July 25, 1974, Ser. No. 491,780
Int. Cl.² A01D *45/02*
U.S. Cl. 56—63 **7 Claims**



1. Deflector apparatus for a harvesting topper, said deflector apparatus comprising:

an upstanding carrier having an upstanding axis and a surface facing laterally outwardly with respect to said axis, said surface being circular in cross section transverse to said axis,

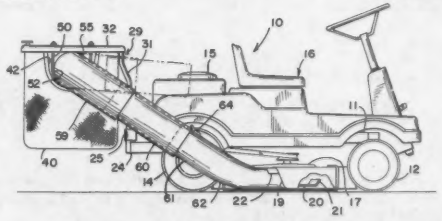
a deflector attached to said carrier and projecting laterally outwardly from said laterally outwardly facing surface, said deflector having two side edges circumferentially spaced from each other along said laterally outwardly facing surface of said carrier and two deflector side surfaces each extending outwardly from a respective one of said side edges generally at an angle greater than 90° with respect to the portion of said laterally outwardly facing surface of said carrier adjacent said respective side edge, said deflector side surfaces tending to converge laterally outwardly of said side edges, and

means connected to said carrier for mounting said deflector apparatus for rotation about the axis of said carrier.

3,934,392
DEBRIS COLLECTOR FOR LAWN AND GARDEN MACHINES

John A. Moery, Willow Springs, and Harlin J. Tretz, Clarendon Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,753
Int. Cl.² A01D *35/26*
U.S. Cl. 56—202 **11 Claims**

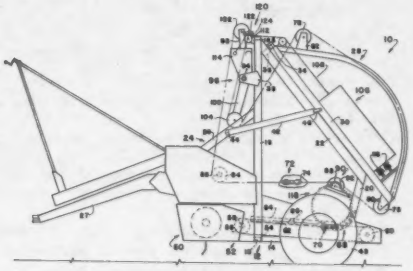


8. In a garden tractor having a debris discharge outlet, means for propelling said debris from said outlet, receptacle means for receiving said debris, said receptacle means including a subframe portion having a transverse opening, and conduit means defining a continuous unobstructed passage interconnecting said discharge outlet with said receptacle means, the improvement wherein said conduit means comprises outlet adapter means engaging said outlet and having an upwardly and rearwardly extending portion, an elbow extension member telescopingly engaging said portion of said outlet adapter means, and an elbow member having a fore and aft leg telescopingly engaging said extension member and a transverse leg rotatably mounted in said transverse opening for rotation of said fore and aft leg and said extension member away from said outlet adapter means upon retraction of said extension member toward said elbow.

3,934,393
BREAKAWAY MECHANISM FOR AN IMPROVED CROP MATERIAL ROLL FORMING MACHINE

Willis R. Campbell, Ephrata, and William F. Ostergren, Terre Hill, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 405,977, Oct. 12, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,822
Int. Cl.² A01D *39/00*
U.S. Cl. 56—341 **6 Claims**



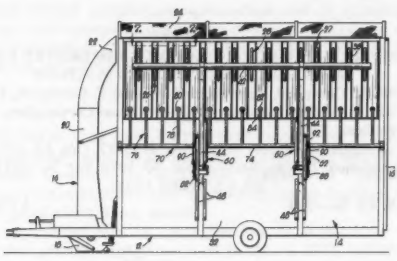
1. In a machine for forming a roll of crop material and having a mobile frame, means mounted to said frame for picking up crop material, lower roll forming means mounted to said frame including means movable for conveying said picked up crop material in a predetermined direction, and upper roll forming means including an endless flexible apron mounted above said conveying means to define a roll-forming area therebetween and being movable in a direction opposite to said predetermined direction for rolling crop material therebetween at said area, a take-up and expansion member mounted to said frame and engaging said flexible apron and tension means attached to said frame and connected to said member so as to bias said member toward a first position which in turn biases said flexible apron toward a contracted position, said member being yieldably movable away from said first position to allow said flexible apron to progressively expand against said biasing as said crop material being rolled at said area grows in diameter, the improvement which comprises:

a breakaway mechanism mounted to said frame and capable of engaging said take-up and expansion member when at its first position so as to prevent said member from yieldably moving away from said first position, which in turn prevents said flexible apron from expanding from its contracted position, until crop material being initially rolled at said roll-forming area between said conveying means and said flexible apron builds into a core having a desired predetermined density, said predetermined density being at least generally equal to the overall density of the remainder of crop material to be subsequently wound about said core to form said roll, said breakaway mechanism being further capable of releasing its engagement with said take-up member when said core of crop material reaches said predetermined density.

3,934,394
CONTINUOUS FEEDING FOR STACK FORMING LOADERS

Harold Keith Garrison, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Continuation of Ser. No. 196,631, Nov. 8, 1971, abandoned. This application Mar. 30, 1973, Ser. No. 346,593
Int. Cl.[2] A01D *87/10*
U.S. Cl. 56—344 33 Claims

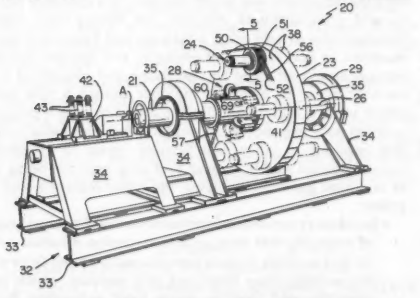


1. In a stacking machine:
a crop feeder;
a stack forming body for receiving the crop from said feeder; and
a press, vertically reciprocable rectilinearly for compacting the crop received by said body,
said press having means for accumulating the crop emanating from the feeder during each successive vertical descent of the press,
said press being retractable from beneath the accumulated crop after the press reaches its lowered position for discharging each crop accumulation into the body after each compaction.

3,934,395
CABLE STRANDING APPARATUS

George W. Vryland, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 19, 1974, Ser. No. 534,639
Int. Cl.[2] D07B *3/06, 3/00*
U.S. Cl. 57—13 21 Claims

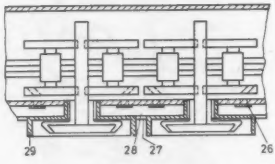


1. A cable stranding apparatus comprising, a rotatable hollow shaft adapted to receive a core for movement longitudinally therethrough, a plurality of rotatable spools carried by said shaft and each having a strand wire wound thereon which is adapted to be helically wound on said core to define a cable, and drive means driven by said shaft and operating to rotate each of said spools about its own axis in a controlled proportion to the speed of rotation of said shaft about its axis, said drive means having means for varying said controlled proportion in response to tension in at least one of said strand wires during helical winding thereof to thereby maintain said tension within a predetermined range.

3,934,396
SPINNING UNIT OPERATING IN ACCORDANCE WITH THE OPEN-END METHOD

Fritz Stahlecker, Josef-Neidhart-Str. 18, D 7341 Bad Ueberkingen, and Hans Stahlecker, Haldenstrasse 20, D 7334 Suessen, both of Germany

Filed Sept. 13, 1973, Ser. No. 396,710
Claims priority, application Germany, Sept. 23, 1972, 2246791
Int. Cl.[2] D01H *1/12, 13/00*
U.S. Cl. 57—58.89 23 Claims

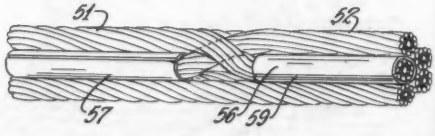


1. An open-end type spinning unit comprising:
a plurality of spinning stations which each have a spinning turbine disposed in turbine housing means, a turbine shaft attached to and rotatable with said spinning turbine and having a rear shaft portion extending through a rear wall of said turbine housing means, and a bearing assembly for rotatably supporting said shaft by way of engagement with said rear shaft portion,
a common bearing housing arranged rearwardly of and adjacent to said turbine housing means for housing respective bearing assemblies and rear shaft portions for said plurality of spinning stations,
common drive means disposed at least in part in said common bearing housing for rotatably driving the turbine shafts for said plurality of spinning stations,
and at least one air inlet opening in said common bearing housing in the zone of each of the bearing assemblies contained therein for providing respective separate cooling air streams to each of said bearing assemblies,
wherein air chambers are arranged in front of the air inlet openings leading into the common bearing housing.

3,934,397
WIRE ROPE SPLICE ASSEMBLY

Boyd C. Black, 1174 S. 30th St., Heath, Ohio 43055

Filed July 11, 1974, Ser. No. 487,539
Int. Cl.[2] B21F *15/04*
U.S. Cl. 57—142 10 Claims



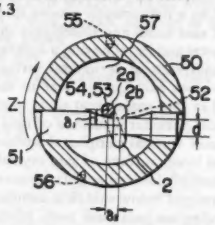
1. In a wire rope splice wherein a length of an end portion of at least one outer strand of the rope is tucked into the central core region of the rope;
a protective tubular sheath of material compatible in wear resistance with the wire rope material surrounding substantially the full length of said tucked end portion of strand of size such as to fill the core space without increasing the diameter of the rope in the splice region over that of the main body of the rope.

3,934,398

FALSE TWISTING SPINDLE

Noboru Shindo, Maikata, and Hiroshi Hashizume, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Claim priority, application Japan, Aug. 13, 1973, 48-91100
Filed July 5, 1974, Ser. No. 486,194
Int. Cl.[2] D01H 7/92
U.S. Cl. 57—77.3 5 Claims



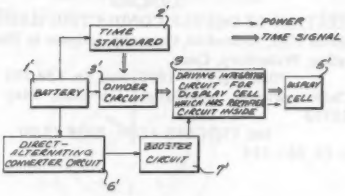
1. False twisting device for producing crimped filamentary yarns comprising a hollow cylindrical spindle having an axis of generation, means mounting the hollow cylindrical spindle for rotation about the axis of generation thereof, a twisting pin secured in the hollow cylindrical spindle and extending thereacross transversely of the axis of generation of the hollow cylindrical spindle having a minimum diameter portion with a center point, the center point of which is displaced transversely of the axis of generation of the hollow spindle in two mutually perpendicular directions distances δ_1 and δ_2 respectively.

3,934,399

ELECTRIC TIMEPIECE INCORPORATING RECTIFIER AND DRIVING CIRCUITS INTEGRATED IN A SINGLE CHIP

Izuhiko Nishimura, and Tadashi Sano, both of Suwa, Japan, assignors to Kabushiki Kaisha Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 369,339, June 12, 1973, abandoned. This application Jan. 11, 1974, Ser. No. 432,720
Claims priority, application Japan, June 12, 1972, 47-58476; United Kingdom, May 24, 1973, 24848/73; Germany, June 12, 1973, 2329875; France, June 12, 1973, 73.7321241; Switzerland, June 12, 1973, 8459/73
Int. Cl.[2] G04C 3/00
U.S. Cl. 58—23 R 9 Claims



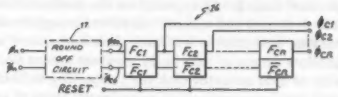
1. An electric timepiece comprising a quartz crystal vibrator for producing a high frequency time standard signal; divider circuit means for producing low frequency time signals in response to said high frequency time standard signal; display means for the digital display of time; driving circuit means including complementary coupled MOS transistors disposed intermediate said divider circuit means and said display means for applying driving signals to said display means in response to said time signals, each said transistor including a source and drain; d.c. potential means for energizing said vibrator and divider circuit means; means for stepping up the voltage supplied by said d.c. potential means and supplying said amplified potential to said driving circuit means to provide said driving signals for energizing said display means, said step-up voltage means including rectifier means including diodes for providing said d.c. potential of higher voltage, each said diode having an anode and cathode, at least said driving circuit means, said complementary coupled MOS transistors and said rectifier means diodes being in the form of a monolithically integrated circuit, said integrated circuit being formed from a common substrate, said substrate having in the surface thereof at least a first region of a first conductivity type, at least a first pair of spaced diffused areas in said first region formed of a second conductivity type opposite to that of said first conductivity type and defining the source and drain of one of said complementary coupled MOS transistors, at least a second pair of spaced diffused areas in said first region, a first diffused area of said second pair being of said second conductivity type, a second diffused area of said second pair being of a high concentration of said first conductivity type, said second pair of diffused areas defining the anode and cathode connections of one of said diodes, and insulating and conductive layers on said substrate, said conductive layers in part overlying said insulating layers and in part engaging said diffused areas to define electrical connections thereto, said driving circuit means, said complementary coupled MOS transistors and said rectifier means diodes being defined by diffused areas and insulating and conductive layers of like construction.

3,934,400

ELECTRONIC TIMEPIECE

Izuhiko Nishimura, Suwa, and Shinji Morozumi, Shimosuwa, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 13, 1974, Ser. No. 469,490
Claims priority, application Japan, May 11, 1973, 48-52344
Int. Cl.[2] G04C 3/00
U.S. Cl. 58—23 R 7 Claims



1. An electronic timepiece including oscillator means for producing a high frequency time standard signal; multi-stage chronographic divider means electrically coupled to said oscillator means for receiving said high frequency time signal and counting elapsed time in response thereto, a group of the last of said chronographic divider means stages being adapted to produce elapsed time signals for display said chronographic divider means including a binary divider stage immediately in advance of said group of chronographic divider means stages for producing a rounding off signal; digital display means including a plurality of digital display elements for the display of elapsed time, each display element respectively corresponding to one of said elapsed time signals from said group of chronographic divider means stages, said digital display means further including a plurality of display register means, each display register means receiving one of said elapsed time signals to be displayed, and one further display register means adapted to receive said rounding off signal and a plurality of series-connected rounding off means, each of said rounding off means being coupled to one of said display registers, said rounding off means being adapted to advance the count of said elapsed time signals received by said display register means by half the period of the rounding off signal counted by said binary divider stage to thereby round off the elapsed time displayed by said display elements.

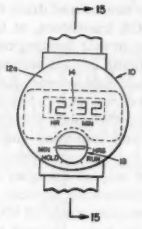
3,934,401
SWITCH FOR ELECTRONIC WATCH

John R. Wood, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 407,147, Oct. 17, 1973, Pat. No. 3,884,033. This application Mar. 21, 1975, Ser. No. 569,824

Int. Cl.² G04C 3/00; G04B 19/30, 27/00; H01H 19/58

U.S. Cl. 58—23 R 11 Claims



1. In an electronically operated watch having internal components including a mounting board, an electric circuit means fixed to said board, a power supply means for powering said watch connected to said circuit means, a housing means for supporting said components therein including front and rear wall members connected by a peripheral sidewall and a display means including hours and minutes indications mounted in said front member and connected to said circuit means, a rotary switch means situated in said front wall member and connected therethrough to said circuit means for setting the hours and minutes on said display means, said switch means comprising:

a relatively thin, disk-like body forming a shallow recess and extending inwardly from said front wall member, said body having a planar bottom portion partially covered by dielectric material, a plurality of terminals on said bottom portion each being exposed on the surface of said dielectric material and connected therethrough to said circuit means, a rotatable actuator disk supported within said shallow recess of said body, contact means on the underside of said actuator disk for contacting individual terminals and interconnecting preselected pairs of terminals in different combinations when the disk is placed in various rotational positions for thereby controlling said display means.

3,934,402
STRUCTURE OF BEZEL PORTIONS OF WATER-TIGHT TIMEPIECE

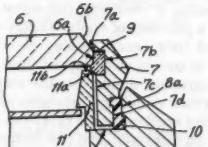
Yoshiaki Fujimori, Suwa, Nagano-ken, Japan

Filed Dec. 5, 1974, Ser. No. 529,882

Claims priority, application Japan, Dec. 5, 1973, 48-138866

Int. Cl. G04B 37/08

U.S. Cl. 5 890 R 1 Claim



1. An improved water-tight mounting for a timepiece comprising a transparent crystal having upper and lower surfaces, a case body for said timepiece underlying said crystal, said crystal being releasably mounted thereon, said crystal having a vertical peripheral surface substantially parallel to said timepiece axis and having a chamfered surface along an exterior edge of said upper surface thereof intercepting said vertical peripheral surface, a bezel releasably connecting said crystal to said case body, said bezel including a step overhanging said chamfered surface of said crystal, said step including a substantially linear edge releasably engaging said crystal along said chamfered surface thereof, said bezel including a gasket seat determined by a first annular groove interiorly located in an inner wall of said bezel and underlying said step provided therein, said crystal and bezel having a corresponding orientation such that said vertical peripheral surface of said crystal substantially overlies said gasket seat in said bezel, a first gasket mounted in said gasket seat so as to abut substantially the entire vertical peripheral surface of said crystal and protruding below said vertical peripheral surface of said crystal for abutting said lower surface of said crystal, said bezel having a second interiorly located annular groove in an outer wall of said bezel arranged below said first annular groove, a bearing ring upstanding on said case body having an outer wall substantially aligned with said vertical peripheral surface of said crystal but spaced from said inner wall of said bezel and including an angular edge at the peak of said outer wall thereof abutting said protruding portion of said first gasket, said case body including a transverse bearing surface on which said bearing ring is releasably supported in upstanding relationship solely against said protruding portion of said first gasket, and an arm issuing substantially upwardly from said case body substantially perpendicularly to said transverse bearing surface thereof, said arm terminating in an inwardly extending flange defining an interiorly located recess in said case body between said flange and said transverse bearing surface, and a second gasket having oppositely extending flanges at opposite ends thereof corresponding respectively to said second interiorly located annular groove in the outer wall of said bezel and said recess defined in said case body between said flange and transverse bearing surface thereof, said second gasket being mounted between said bezel and said case body under compression and said oppositely extending flanges at the opposite ends thereof being respectively releasably mounted in said second interiorly located annular groove in the outer wall of said bezel and said recess defined in said case body between said flange and transverse bearing surface thereof, said second gasket elevating said bezel off said transverse bearing surface of said case body.

3,934,403
FIXATION OF DOUBLE CONDUCTING HAIRSPRING

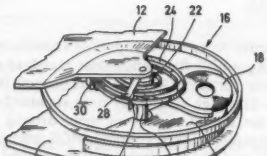
Wilhelm Tilse, Birkenfeld, Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 17, 1975, Ser. No. 558,753

Claims priority, application Germany, May 6, 1974, 2421750

Int. Cl.² G04B 17/06; B23P 13/00

U.S. Cl. 58—114 7 Claims



1. A conductor-hairspring and hub arrangement for an electric watch comprising:

a hub having a groove;

a hairspring being fastened at one end in said groove and which protrudes from said groove;

means forming an electric conductor affixed on the protruding part of said hairspring and for electrically insulating said electric conductor from said hairspring.

3,934,404

SECOND HAND REGULATING MECHANISM

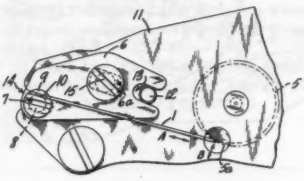
Eiichi Matsuura, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 14, 1974, Ser. No. 523,893

Claims priority, application Japan, Nov. 17, 1973, 48-132949

Int. Cl.² G04B 15/00; G04C 3/00

U.S. Cl. 58—116 R 8 Claims



1. In a regulating mechanism for a timepiece second hand: a rotary ratchet-toothed wheel rotationally driven during use in a forward rotational direction for driving a timepiece second hand; a second jumper spring having an elongated major portion and terminating at one end in a projection which projects generally transversely of said major portion; and means mounting said second jumper spring so that said major portion thereof lies in a plane which is generally parallel to and spaced from the plane in which said ratchet-toothed wheel lies and with said projection in direct engagement with the teeth of said ratchettoothed wheel to effectively prevent reverse rotation thereof.

3,934,405

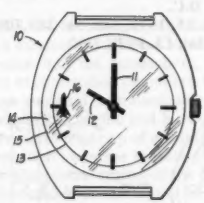
ROTATABLE TRANSPARENT DISC SECOND HAND FOR WATCH

Ronald P. Baker, 5676 Broadview Road, Parma, Ohio 44134

Filed Dec. 23, 1974, Ser. No. 535,946

Int. Cl.² G04B 19/00, 37/08

U.S. Cl. 58—126 A 4 Claims



1. In a timepiece of the type having a rotatable first hollow shaft for referencing minutes and a rotatable second hollow shaft for referencing hours, each shaft concentrically disposed about a rotatable central shaft for referencing seconds wherein said first shaft carries a minute hand and said second shaft carries an hour hand each said hand operatively disposed above a stationary dial face having indiciae marked thereon to indicate time, and said second shaft is rotatable in annularly spaced apart relationship with said first shaft, the improvement comprising a hub means having an axial bore and a radially outwardly extending flange near one end thereof, a single transparent disc having a reference mark near the periphery thereof, said disc being affixed to said hub means in abutment against said flange said hub means being demountably disposed on said central shaft, a portion of the surface of said hub means being in slight frictional engagement with said first hollow shaft to seal the annular space between said central shaft and said first hollow shaft against finely divided dusty material and moisture.

3,934,406

BALANCE WHEEL ASSEMBLY AND METHOD FOR MANUFACTURE THEREOF

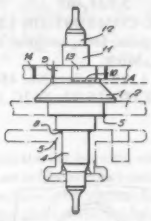
Rene Bornand, Bienne, Switzerland, assignor to OMEGA Louis Brandt & Frere S.A., Switzerland

Filed Nov. 5, 1974, Ser. No. 521,062

Claims priority, application Switzerland, Nov. 29, 1973, 16753/73

Int. Cl.² G04B 13/02

U.S. Cl. 58—140 R 7 Claims



1. In a balance wheel assembly including a balance wheel, a balance staff having a shoulder, a balance spring, and a flange which rotates relative to the balance staff, said balance staff including a saddle and a hub for the balance wheel, the improvement wherein said balance wheel hub and the plane of the balance spring are arranged on opposite sides of said saddle, and the flange is completely disengaged from the hub by said shoulder, and wherein the interior end of the balance spring is fastened directly to the balance staff without any intermediate component.

3,934,407

METHOD OF AND APPARATUS FOR PRODUCING PARTICULARLY HIGH-STRENGTH CHAINS

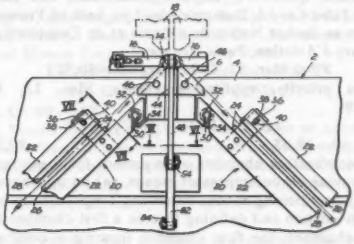
Gerhard Lange, Baden-Wurttemberg, Germany, assignor to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid, Reutlingen, Germany

Filed Sept. 20, 1974, Ser. No. 507,802

Claims priority, application Germany, Sept. 22, 1973, 2347768

Int. Cl.² B21L 3/02

U.S. Cl. 59—31 21 Claims



1. Chain welding apparatus for welding successive interconnected links of a chain strand comprising:

a frame;

a saddle secured to said frame for supporting a chain link to be welded, said saddle having an approach side and a discharge side;

a guide means disposed on each of said approach and discharge sides of said saddle for supporting and guiding said chain strand, said guide means on at least said approach side having at least a first and a second guide face, each of said faces being adapted to guide alternate links respectively of said chain strand, the planes of said first and second guide faces enclosing an angle of at most approximately 45° on opposite sides respectively of a vertical plane through the longitudinal axis of the chain strand; and

means attached to said frame and positioned adjacent said chain link to be welded for erecting and securely holding said link in an upright position for welding.

3,934,408

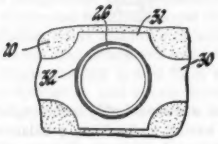
CERAMIC COMBUSTION LINER

John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1974, Ser. No. 456,601

Int. Cl.² F23D *15/02*; F02G *3/00*

U.S. Cl. 60—39.65 **11 Claims**



1. A combustion apparatus comprising, in combination, a combustion liner defining a space for combustion of fuel, the liner having a wall of ceramic material of approximately circular cross section defining the exterior of the liner and defining a circumferential row of ports for admission of air into the liner, the air being significantly cooler than the wall in normal operation of the combustion apparatus, and means for reducing thermal stresses in the wall due to local cooling of the wall by air entering through the ports comprising a bushing slidably received in each port and a retainer ring means encircling the exterior of the liner supported only through the said wall connected to the bushings in a said row of ports effective to retain the bushings in the ports, the width of the retaining ring being not more than a value slightly greater than the width of the bushings transversely of the retaining ring.

3,934,409

GAS TURBINE COMBUSTION CHAMBERS

Hervé Alain Quillévéré, Issy-les Moulineaux, and Jacques Emile Jules Caruel, Dammarie-les-Lys, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

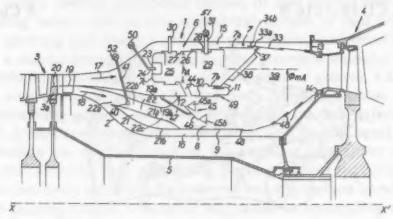
Filed Mar. 12, 1974, Ser. No. 450,321

Claims priority, application France, Mar. 13, 1973, 73.08819

Int. Cl.² F02C *3/00*, *7/22*

U.S. Cl. 60—39.65 **9 Claims**

1. A combustion chamber arrangement for a gas turbine engine having air commpressor means, (a) an upstream portion; (b) partitioning means extending longitudinally of the upstream portion and defining therein a first chamber and a second chamber, the first chamber forming a combustion chamber comprising (1) a primary combustion zone having primary air intake means, idling fuel injection means and ignition means, and (2) a secondary combustion zone having secondary air intake means, and the second chamber forming a combustion chamber of the premixed burning type comprising a conduit having supplementary fuel injection means in an inlet region thereof, and a flame stabilizer system in a region intermediate said inlet region and an outlet of the conduit; (c) means in the air compressor means for supplying a first flow of air to the first chamber to feed (1) the primary combustion zone with primary combustion air through the primary intake means and (2) the secondary combustion zone with secondary combustion air through the secondary air intake means, and for supplying a second flow of air to the inlet region of the conduit; (d) means for running the gas turbine engine at idling speed comprising means for supplying fuel to said idling fuel injection means for said primary combustion zone at an idling flow rate to form a substantially stoichiometric air and fuel



mixture with the primary combustion air in the primary zone at said idling speed of the gas turbine engine; (e) supplementary means for running the gas turbine engine at maximum speed comprising mean for supplying fuel to said supplementary fuel injection means at a supplementary flow rate to form a premixed air and fuel mixture with the second flow of air in said intermediate region of said conduit, and means for igniting said premixed air and fuel mixture in said intermediate region; (f) a downstream portion forming a mixture chamber to receive first and second gas flows issuing from the first and second chambers, respectively; and (g) means for producing at least one constriction of at least one of said gas flows at its entry into the downstream portion in order to produce intermixing of the two gas flows in the mixture chamber.

3,934,410

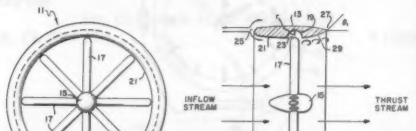
QUIET SHROUDED CIRCULATION CONTROL PROPELLER

Robert M. Williams, Chantilly, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 15, 1972, Ser. No. 289,708

Int. Cl. F02k *3/00*

U.S. Cl. 60—269 **3 Claims**



1. A quieting propeller shroud comprising:

a fixed axially extending annular shroud for enclosing a propeller thrust stream and having an exit diffusion angle;

a recess within said shroud, coextensive with the inside circumference of said shroud and having a circular cross-section to reduce the boundary layer at the interior of said shroud to substantially maintain the thrust stream diffusion angle at the shroud diffusion angle;

a propeller having a plurality of short chord blades having a generally elliptical shape mounted for

a blowing slot adjacent the trailing edge of each blade for circulation control blowing over the smooth rounded surface edge and for developing thrust proportionately to the momentum flux of air out of said slot; and

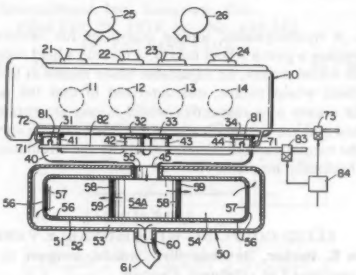
said recess has a radius of curvature "r" substantially equal in size to the vortex core generated at the propeller blade tip, and the recess centered about the vortex center generated by the propeller tip.

3,934,411

SYSTEM FOR REDUCING POLLUTANTS IN ENGINE EXHAUST GAS

Kenji Masaki, Yokohama, and Mitinobu Konno, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 12, 1974, Ser. No. 496,893
Claims priority, application Japan, Aug. 17, 1973, 48-92289
Int. Cl.² F02B *75/10*
U.S. Cl. 60—286 **8 Claims**



1. A system for reducing concentrations of harmful substances in an exhaust gas from an internal combustion engine before emission into the atmosphere, the engine having an even number of combustion chambers, the system comprising:

an exhaust manifold communicable with the combustion chambers of the engine and having an outlet;

a thermal reactor made up of a cylindrical inner body forming a reaction chamber therein and having an inlet located in the central region of the peripheral wall thereof and connected with said outlet of said exhaust manifold and a cylindrical outer body arranged to enclose said inner body with a space therebetween and provided with a discharge port formed in the central region of the peripheral wall thereof, said space communicating with said reaction chamber through holes formed in both end regions of said inner body and being isolated from said inlet; and

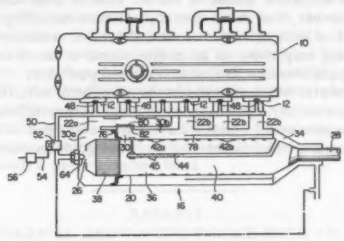
first means to cause said exhaust manifold to discharge two differently composed exhaust gases alternately in dependence on the firing sequence of the combustion chambers, the first of said exhaust gases containing relatively large amounts of carbon monoxide and unburned fuel and the second containing relatively small amounts of carbon monoxide and unburned fuel and a relatively large amount of air.

3,934,412

THERMAL REACTOR FOR AFTERBURNING AUTOMOTIVE INTERNAL COMBUSTION ENGINE EXHAUST GASES

Kenji Masaki, Yokohama, and Hatuo Nagaishi, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 8, 1974, Ser. No. 496,011
Claims priority, application Japan, Aug. 17, 1973, 48-92292
Int. Cl.² F01N *3/14*; F02B *75/10*
U.S. Cl. 60—288 **14 Claims**



1. A thermal reactor for burning unburned components in exhaust gases of an internal combustion engine before emission to the atmosphere, the engine having a plurality of exhaust ports and the reactor including:

an outer casing having an exhaust gas inlet communicating with a plurality of exhaust ports;

an inner casing disposed within the outer casing and defining an outer chamber between the outer casing and the inner casing and an inner chamber therein, the inner casing having an inlet for the inner chamber to communicate with the outer chamber, an outlet communicating with the atmosphere, and a plurality of perforations formed therein to further communicate with the outer chamber; and

characterized by an oxidation catalyst disposed in the inner chamber of said inner casing for promoting oxidation of the unburned components in the exhaust gases introduced through the inlet of the inner casing to generate oxidation reaction heat;

a first secondary air injection nozzle disposed in the inner chamber of the inner casing between said oxidation catalyst and the outlet of the inner casing; and

a second secondary air injection nozzle disposed in a portion upstream of said oxidation catalyst for injecting secondary air into said oxidation catalyst.

3,934,413

AIR FLOW CONTROL UNIT FOR ENGINE SECONDARY AIR SUPPLY

David W. Beiswenger; Gordon R. Paddock, both of Rochester, and Ernst L. Ranft, Webster, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed July 5, 1974, Ser. No. 485,817
Int. Cl.² F02B *75/10*; G05D *11/00*
U.S. Cl. 60—289 **2 Claims**

1. Means for supplying pressurized air at an accessory air pressure for an accessory mounted on a vehicle equipped with a combustion engine having an exhaust system, the pressurized air supply means comprising, in combination:

an air pump driven by the engine, the air pump having an outlet;

an air control unit including a chamber open to the air pump outlet, the chamber having an exhaust supply outlet, an accessory supply outlet, a high pressure relief outlet and a low pressure relief outlet, the exhaust supply and low pressure relief outlets being diametrically opposed across the chamber;

check valve means in the accessory supply outlet to prevent air flow back into the chamber;

a high pressure relief valve in the high pressure relief outlet, the high pressure relief valve being openable by air at a high pressure greater than the accessory air pressure to vent the chamber to the atmosphere;

conduit means connecting the exhaust supply outlet with the engine exhaust system;

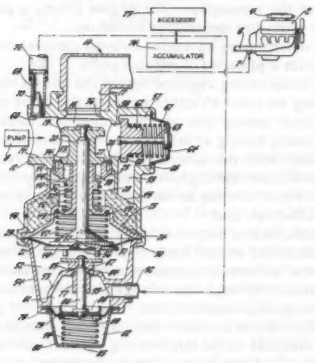
valve means in the chamber reciprocable between a first position closing the exhaust supply outlet and a second position closing the low pressure relief outlet;

valve actuation means in the air control unit outside the chamber, the valve actuation means including a stem linked with the valve means, the valve actuation means being responsive to an engine signal to move the valve means between its first and second positions;

an annular insert member in the air control unit, the insert member having an inner cylindrical surface defining a low pressure relief conduit having one end open to the low pressure relief outlet and a central guide portion within the low pressure relief conduit and coaxial therewith, the central guide portion surrounding the stem, the insert member having an aperture through the inner cylindrical wall opening the low pressure relief conduit to the atmosphere;

a low pressure relief valve member reciprocable on the guide portion within the low pressure relief conduit, the low pressure relief valve member sealingly engaging the guide portion and the inner cylindrical wall;

spring means biasing the low pressure relief valve member toward the low pressure relief outlet, the spring means thereby balancing the force of air on the low pressure relief valve member with the vlave means in its first position, the spring means having such characteristics that the low pressure relief valve member closes the low pressure relief outlet from the aperture when the air pressure in the chamber is less than the accessory air pressure but moves past the aperture to open it to the low pressure relief outlet when air pressure in the chamber exceeds the accessory air pressure.



3,934,414

HYDRODYNAMIC TORQUE CONVERTER FOR VEHICLES

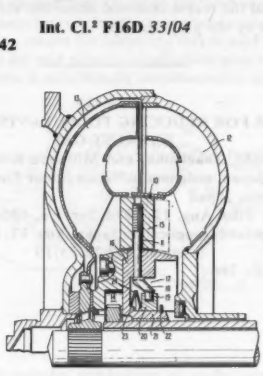
Hans Merkle, Stuttgart, and Eberhard Fröitschner, Gerlingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 9, 1974, Ser. No. 513,387

Claims priority, application Germany, Oct. 9, 1973, 2350600

Int. Cl.² F16D *33/04*

U.S. Cl. 60—342 **19 Claims**



1. A hydrodynamic torque converter for vehicles which comprises a pump wheel means, a turbine wheel means and a guide wheel means, an adjustable blade means at least at one of these wheel means, characterized in that the adjustable blade means of a respective wheel means are rotatably supported and are automatically adjustable against a spring force by the torque exerted thereon solely by the circulating flow of the hydraulic medium.

3,934,415

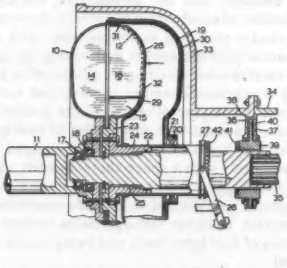
FLUID COUPLING WITH MOVABLE VANES

John E. Becker, Bowmanville, Canada, assignor to Cluaran Associates Ltd., Oshawa, Canada

Continuation-in-part of Ser. No. 352,971, April 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 158,873, July 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 81,667, Oct. 19, 1970, abandoned. This application May 20, 1974, Ser. No. 471,519

Int. Cl.² F16D *33/02*

U.S. Cl. 60—353 **6 Claims**



1. A fluid clutch of the kind specified comprising power input and output means (11, 13), a pump element (10) and a turbine element (12) connected respectively to the power input and power output means for rotation thereby and providing respectively cooperating pump and turbine chambers rotatable about the same axis and constituting a working chamber, a quantity of working liquid in the working chamber, each element comprising a respective annular element

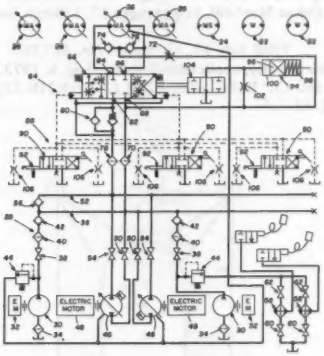
shell (**10, 12**) and a respective set of radially-extending vortex producing vanes (**14, 16**), the pump element having an axial extension (**19**) thereof surrounding the turbine element shell to form a compartment between the extension and the turbine element shell, the turbine element comprising another annular shell (**30**) fixed thereto, disposed within the said compartment axially spaced from and rotatable with the turbine element shell to form a corresponding enclosure of constant volume therebetween, at least a portion of some of the vanes of said turbine element being movable axially through slots formed in the wall of the respective turbine element shell out of and into the turbine element chamber and respectively into and out of the last-mentioned constant volume enclosure for movement of the movable vanes or vane portions into and out of vortex-producing operative cooperation with the vanes of the pump element, and means operatively connected to the said movable vanes or vane portions for moving them through the slots from a clutch-engaged position in the turbine element chamber in which the pump and turbine vanes cooperate to produce power-transmitting vortices, to a clutch-disengaged position in which the pump and turbine vanes cannot cooperate to produce such vortices.

3,934,416

CENTRAL HYDRAULIC SYSTEM FOR MARINE DECK EQUIPMENT

Werner P. Goldkuhle, Longview; Richard E. Arnold, Dallas, and Malcolm Ray Johnson, Flint, all of Tex., assignors to LeBus International, Inc., Longview, Tex.

Filed Feb. 25, 1974, Ser. No. 445,252
Int. Cl.² F15B *11/16*
U.S. Cl. 60—484 **26 Claims**



1. A central hydraulic system for a plurality of marine deck equipment comprising:

variable displacement over center pump means for supplying hydraulic fluid at a predetermined pressure;

a plurality of hydraulic motors each individual to and drivingly connected to one of the marine deck equipment and each adapted for actuation by pressurized hydraulic fluid supplied by the variable displacement over center pump means to drive its associated marine deck equipment;

closed loop circuit means interconnecting the pump means and the motors;

a plurality of infinitely variable volume pressure compensated valves each individual to one of the hydraulic motors and each adapted to control the volume of pressurized hydraulic fluid flowing to its associated hydraulic motor and thereby regulate the speed of operation of the associated marine deck equipment;

a plurality of brake means each individual to one of the marine deck equipment and each for normally preventing operation of its associated equipment;

hydraulic actuator means individual to each brake means and adapted for actuation by pressurized hydraulic fluid supplied by the variable displacement pump means to disable the brake means and thereby permit operation of the associated equipment; and

hydraulic circuit means responsive to actuation of the associated infinitely variable volume pressure compensated valve to direct pressurized hydraulic fluid to the associated hydraulic motor for actuating the associated hydraulic actuator means and thereby disabling the associated brake means;

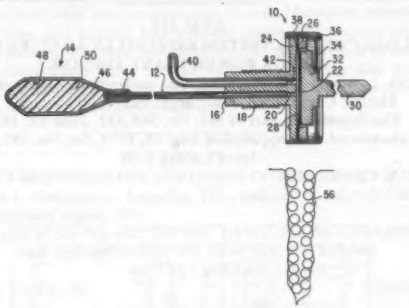
said hydraulic circuit means including valve means for receiving pressurized hydraulic fluid from the connections between the associated infinitely variable volume pressure compensated valve and the associated hydraulic motor and sequence valve means for directing pressurized hydraulic fluid to the hydraulic actuator whenever the differential between the hydraulic pressure in the connections extending from the infinitely variable volume pressure compensated valve and the hydraulic motor exceeds a predetermined level.

3,934,417

THERMAL RESPONSIVE DEVICE WITH AN ADSORBENT CARBONACEOUS MATERIAL

Denis G. Wolfe; Hugh J. Tyler, both of Santa Ana, Calif.; Wilbur F. Jackson, deceased, late of Rolling Hills, Calif., by Linda A. Benton, trust administrator, Long Beach, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 12, 1973, Ser. No. 405,950
Int. Cl.² F01B *19/02*; G01K *5/32*
U.S. Cl. 60—516 **11 Claims**



11. A thermal responsive device comprising

means, including a metal bulb, forming an enclosed chamber;

porous carbonaceous granules in the metal bulb, formed by substantially complete pyrolytic decomposition of synthetic polymer granules containing polyvinylidene chloride in a purifying atmosphere at a temperature in the range of about 138°C to 177°C;

a charge of gas in the chamber, selected from the group consisting of helium, neon, argon, krypton, and xenon; and

expandable and retractable means responsive to the gas pressure in the chamber.

3,934,418

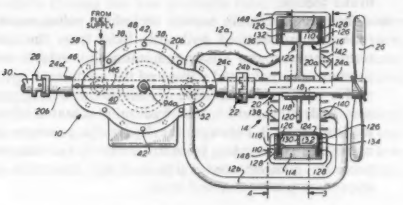
TURBINE ENGINE

Earl A. DeBaun, 4447 First Ave., North, St. Petersburg, Fla. 33713

Filed Dec. 19, 1974, Ser. No. 534,455
Int. Cl.² F02G *3/00*; F02C *5/06*
U.S. Cl. 60—624 **3 Claims**

1. A turbine engine comprising a rotary shaft for driving a related mechanism, a pair of similar compressors mounted diametrically opposite from each other upon said shaft, and a

turbine having a rotor fixed to said shaft for rotation therewith and provided with a pair of side-by-side, integral, vaned, annular, gas-receptive channels; each of said compressors comprising a cylinder including a combustion chamber, a piston operative in said cylinder and partially defining said chamber, fuel intake valve means, gas exhaust valve means, ignition means for igniting fuel within said chamber, said pair of compressors including cam means fixed upon said shaft and coacting separately and alternately with said intake valve means of both

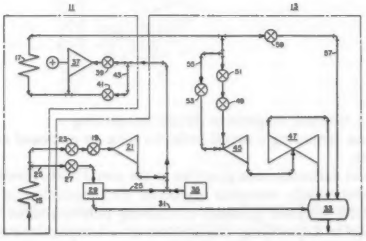


compressors, with said exhaust valve means of both compressors, and with said pistons of both compressors to reciprocate said pistons; said engine further comprising ducts connecting the combustion chambers of the two compressors separately to diametrically opposite inlets of the two said channels of the turbine, whereby the force of exhaust gases from the combustion chambers of the two compressors is regularly, alternately applied to said turbine rotor at diametrically opposite points thereof to yield smoothe, efficient operation of the engine.

3,934,419
LOAD CONTROL SYSTEM ESPECIALLY ADAPTED FOR A HTGR POWER PLANT TURBINE

Ola J. Aanstad, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 369,332, June 12, 1973, abandoned. This application Aug. 15, 1974, Ser. No. 497,608
Int. Cl. F01k *9/00*
U.S. Cl. 60—660 **60 Claims**



1. In a turbine system having a first turbine stage with a first flow valve to determine the flow therethrough, a first bypass line with a first bypass valve therein connected across the first turbine stage and the first flow valve, a second turbine stage with a second flow valve to determine the flow therethrough, and a second bypass line with a second bypass valve therein connected across the second turbine stage and the second flow valve, an improved control arrangement for simultaneously administering the loading of the first and second turbine stages comprising:

input means providing an input signal indicative of the power requirements of the turbine system;

first detecting means providing a first power signal indicative of the power output of the first turbine stage;

first comparing means for detecting the difference between the power requirements indicated by said input signal and the power output of the first turbine stage indicated by said first power signal and providing a first error signal indicative thereof;

first regulating means to adjust the first flow valve in response to said first error signal;

first compensating means to adjust the first bypass valve in response to adjustment of the first flow valve to produce an effect on the flow through the bypass line that is the inverse of the effect produced on the flow through the first turbine stage by adjustment of the first flow valve;

second detecting means providing a second power signal indicative of the power output of the second turbine stage;

second comparing means for determining the difference between the power requirements indicated by said input signal and the power output of the second turbine stage indicated by said second power signal and providing a second error signal indicative thereof;

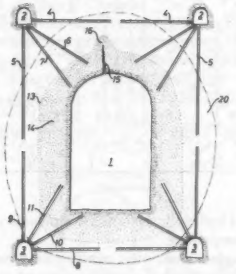
second regulating means to adjust the second flow valve in response to said second error signal; and

second compensating means to adjust the second bypass valve in response to adjustment of the second flow valve to produce an effect on the flow through the second bypass line that is the inverse of the effect produced on the flow through the second turbine stage by adjustment of the second flow valve.

3,934,420
METHOD OF SEALING THE ROCK AROUND A ROCK CHAMBER INTENDED FOR A MEDIUM, THE TEMPERATURE OF WHICH IS BELOW THE NATURAL TEMPERATURE OF THE ROCK

Erik Ingvar Janelid, Forsetevagen 18, Djursholm, and Carl-Olof Oskar Morfeldt, Friggavagen 17, Lidingo, both of Sweden

Filed July 11, 1974, Ser. No. 487,763
Claims priority, application Sweden, Aug. 6, 1973, 7310782
Int. Cl.[2] B65G *5/00*; E21F *17/16*; E21B *33/13*
U.S. Cl. 61—.5 **11 Claims**



1. A method for sealing a chamber surrounded by rock to adapt said chamber to store therein a substance having a predetermined storage temperature lower than the natural temperature of said rock comprising the steps of injecting into said surrounding rock a sealing agent having a melting point not more than about 100°C higher than said storage temperature of said substance, bringing the temperature within said chamber to below the melting point of said sealing agent substantially simultaneously with commencement of injection of said sealing agent into said surrounding rock, and continuing injection of said sealing agent to form about said chamber and within said surrounding rock a layer of frozen sealing agent contiguous with said chamber and a liquid layer of said sealing agent extending about said frozen layer.

3,934,421
GROUND STABILIZATION MATTING

Berthold H. Daimler, Remscheid-Lennep, Germany; Jan Vos, Dieren, Netherlands, and Wilhelm Herveling, Wuppertal, Germany, assignors to Akzona Incorporated, Asheville, N.C.

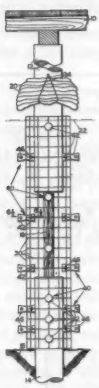
Continuation of Ser. No. 315,454, Dec. 15, 1972, abandoned.
This application Aug. 2, 1974, Ser. No. 494,157
Int. Cl.² E02D 3/08; D01D 5/22
U.S. Cl. 61—35 8 Claims

1. A vertical load bearing structure comprising the combination of a matting of looped, intersecting interbonded synthetic polymer filaments, and a compatible soil contained in the matting, said filament loops being at least one millimeter in diameter and having a loop extension of at least 10 times the individual filament diameter, the combination of matting and compatible soil having increased vertical load bearing capacity and resistance to lateral shifting over the individual elements of the combination.

3,934,422
PILE SPLICING APPARATUS AND METHOD

Larry E. Fredrickson, and Thomas L. Coates, both of 529 S. 49th St., Tacoma, Wash. 98404

Filed Nov. 11, 1974, Ser. No. 522,777
Int. Cl.² E02D 5/60
U.S. Cl. 61—53 10 Claims



1. Apparatus for splicing in situ top and bottom segments of marine piling, the bottom segment being embedded in the ground, the apparatus comprising in combination:

a. an elongated cage of stiff, fluid-cement-permeable mesh material dimensioned to surround and overlap both of the pile segments while bridging the space between the segments,

b. an elongated concrete form bag of longitudinally collapsible, substantially fluid-cement-impermeable material dimensioned to overlie the cage,

c. a plurality of radially extending spacers dimensioned to abut the pile segments on one side of the cage and the concrete form bag on the other side of the cage, thereby spacing the cage predetermined radial distances to opposite sides of the pile segments and form bag, respectively,

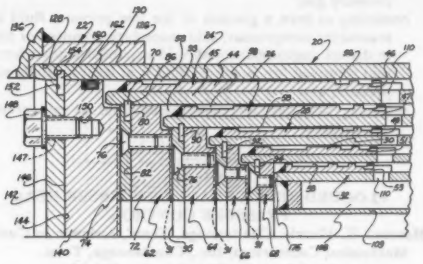
d. securing means securing the spacers to the cage, and

e. fastening means fastening the top and bottom of the concrete form bag to the top and bottom segments of the marine piling, respectively.

3,934,423
POWER CYLINDER CONSTRUCTION

Roland Haller, Shiloh, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.

Filed Mar. 27, 1974, Ser. No. 455,062
Int. Cl.² F01B 7/20
U.S. Cl. 92—52 9 Claims

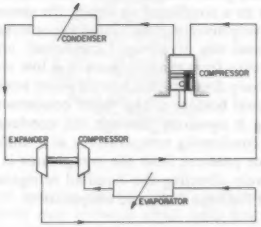


8. A multiple stage telescoping power cylinder characterized by housing means including a housing base opening; a housing base means removably covering said base opening to provide access to the telescoping stages within said housing means; a plurality of telescoping piston and cylinder assemblies in said housing means and surrounding a central ram, each of said assemblies including a cylindrical member, transfer disc means on one end of the cylindrical member, and a snap ring disconnectably mounting said transfer disc means to said cylindrical member, said transfer disc means including inner and outer disc portions, and threaded fasteners accessible from said housing base opening removably securing said disc portions together at confronting disc surfaces, one of said annular grooves being formed by said confronting disc surfaces to permit access to and removal of said snap ring upon removal of said threaded fasteners.

3,934,424
REFRIGERANT EXPANDER COMPRESSOR

Fred L. Goldsberry, Amarillo, Tex., assignor to Enserch Corporation, Dallas, Tex.

Division of Ser. No. 422,759, Dec. 7, 1973, Pat. No. 3,864,065.
This application Sept. 20, 1974, Ser. No. 507,864
Int. Cl.² F25B 9/00
U.S. Cl. 62—87 1 Claim



1. A method of improving the efficiency of a compression refrigeration system having a primary compressor, condenser and evaporator comprising:

passing high pressure fluid through the condenser;

directing the high pressure fluid from the condenser into an inlet passageway within an axially extending rotatable shaft;

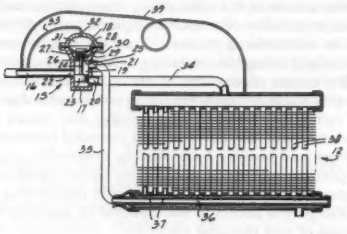
channeling the high pressure fluid from the inlet passageway radially outwardly through at least one passageway

formed in a rotary impeller mounted for rotation with the shaft;
expanding the high pressure fluid through nozzles substantially perpendicular to the radial passageway to impart rotary movement to the rotary impeller;
extracting the low quality expanded fluid to an evaporator;
evaporating the low quality fluid in an evaporator to low pressure gas;
removing at least a portion of the low pressure fluid to a secondary compressor, said secondary compressor being in driven engagement with said expander rotor whereby said removed low pressure fluid is at least partially compressed; and
returning said partially compressed fluid to said primary compressor.

3,934,425
FLOODED REFRIGERANT CONDENSER HEAD PRESSURE CONTROL

Herman H. Morris, Chattanooga, Tenn., assignor to Custom Mechanical Contractors, Inc., Chattanooga, Tenn.

Filed Sept. 5, 1974, Ser. No. 503,296
Int. Cl.² F25B *49/00*
U.S. Cl. 62—117 **4 Claims**



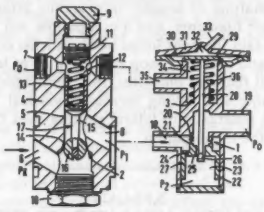
4. A method of providing a constant condenser pressure head in a refrigeration system of the vapor compression type comprising the steps of:
driving a refrigerant through a closed refrigeration circuit;
at a first point in said circuit compressing hot vapor in a refrigerant compressor to add heat of compression and directing the compressed vapor in a stream at a variable pressure through the circuit,
at a second point in said circuit directing the heated vapor stream to a condenser to liquify the stream,
selectively diverting the heated vapor stream to the gravitational top of a vapor condenser unit when vapor pressure from the compressor is low and
selectively diverting the heated vapor stream to the gravitational bottom of the vapor condenser unit and bubbling it upwardly through the condenser to maintain the condensing temperatures at a uniform level when vapor pressure from the compressor is high; and
successively directing the liquified refrigerant through the circuit for expansion and evaporation.

3,934,426
THERMOSTATIC EXPANSION VALVE FOR REFRIGERATION INSTALLATIONS

Hans Jörgen Jespersen, Sonderborg, and Leif Nielsen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 7, 1974, Ser. No. 495,387
Claims priority, application Germany, Aug. 13, 1973, 2340836
Int. Cl.² F25B *49/00*
U.S. Cl. 62—205 **6 Claims**

1. A thermostatic expansion valve assembly for a refrigeration system having an evaporator and an air cooled condenser, comprising, an operating element dependent upon the superheat temperature of said evaporator, a first flow passage having a first valve unit operated by said operating element, a second flow passage having a second valve unit in series with

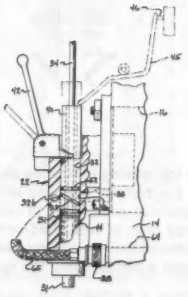


said first valve unit which closes at a variable rate which increases as the condenser pressure rises, a reference spring and a displaceable element for operating said second valve unit, said displaceable element being biased in one direction by condenser pressure and in the other direction by evaporator pressure and said reference spring.

3,934,427
DISPENSING MACHINE

Richard M. Keyes, Rockford, Ill., assignor to Beatrice Foods Co., Chicago,, Ill.

Filed Sept. 9, 1974, Ser. No. 504,525
Int. Cl.² A23G *9/00*
U.S. Cl. 62—342 **13 Claims**



9. In a semi-frozen confection machine including a freezing compartment having an outlet at its front end and adapted to freeze a liquid comestible; a reservoir communicating with the freezing compartment and adapted to hold and supply the liquid comestible to the freezing compartment; and a rotary beater in the freezing compartment to rotatably stir the comestible therein; and improvement comprising:
a valve block having a back side adjacent the freezing compartment outlet and having a valve chamber therein; said

chamber having a dispensing outlet and first and second inlet ports; a first passageway connecting one inlet port to the freezing compartment; a second passageway leading from the other inlet port to the exterior of the valve block at one side thereof; a supply of flavoring material; a conduit connected to said supply and having an end at said one side of the valve block; a coupling on the end of the conduit and having a portion received in the second passageway; seal means on the coupling for sealing against the passageway; the valve block having a bore extending transverse of the passageway at a location between the seal means and the one side of the block; and a manually-removable fastener extending through the bore and engaged with the coupling to hold it in the passageway, a valve member mounted in the valve chamber and reciprocably movable between an open position and a closed position blocking flow through the inlet ports; a pair of spaced parallel grooves on the valve member located one below and one above the inlet ports when the valve member is in the closed position; a third groove on the valve member intermediate said pair and shaped so that it is below one of the inlet ports and above the other; and a sealing ring disposed in each groove and sealing against the valve chamber; whereby the intermediate sealing ring seals the inlet ports from each other when the valve member is in closed position.

10. In a machine for dispensing a semi-frozen comestible and a flavoring material including a freezing compartment; refrigeration means for refrigerating a surface of the freezing compartment; a first reservoir for holding a liquid comestible; a first supply means for supplying the liquid comestible and a gas to the freezing compartment; means in the freezing compartment for mixing the frozen comestible and the gas therein; and a second reservoir for a flavoring material, the improvement comprising:

a valve block at the freezing compartment and having at least one generally upright elongate chamber therein; said chamber having a dispensing outlet at its lower end; and first and second inlet ports at opposite sides of the chamber and spaced about an equal distance above the dispensing outlet so that the inlet ports are about the same level in the chamber; a first passageway connecting one inlet port to the freezing compartment; a second passageway connecting the other inlet port to said second reservoir means; feed means for feeding the flavoring material under pressure through the second passageway to said other inlet port; an elongate valve member mounted in the chamber and reciprocably movable between an open position and a closed position; said valve member having upper and lower spaced sealing rings extending thereabout in planes crosswise of the valve member respectively above and below said inlet ports when the valve member is in its closed position and an intermediate sealing ring extending around the valve member intermediate the upper and lower sealing rings and canted relative to the valve member so that it is below one of the inlet ports and above the other inlet port when the valve member is in its closed position to seal the inlet ports from each other, said upper, lower and intermediate sealing rings being disposed above said inlet ports when the valve member is moved to its open position whereby flow of semi-frozen comestible and flavoring material occurs simultaneously when the valve member is in open position and is stopped when the valve member is in its closed position.

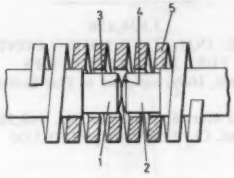
3,934,428

FLEXIBLE COUPLING

Sven Arvid Hedin, Huddinge, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 10, 1974, Ser. No. 468,761
Int. Cl.² F16D *3/52*
U.S. Cl. 64—15 C **4 Claims**

1. A coupling for two rotating torque transferring shafts which are subject to variations in the angles they rotate with respect to each other and are exposed to strong axial pressures comprising, prepared heading surfaces on the ends of two shafts formed as conical or spherical surfaces so that, when the shafts are parallel and the ends of the shafts are placed in contact with each other they make contact with each other at a single central point, and when the shafts form an angle of



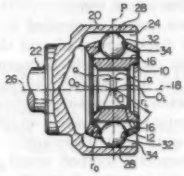
less than 180° with respect to each other during a period of rotation, the two end surfaces roll against each other, and means for preventing the two ends of the shafts from moving radially relative to each other, said means serving also as a torque transfer device transferring a portion of the turning torque between the two shafts, where the torque transferring device is a screw spring which is arranged around the ends of the two shafts.

3,934,429

CONSTANT VELOCITY UNIVERSAL JOINT

Koichi Takahashi, Yokohama; Nobuteru Hitomi, Yokosuka, and Taisuke Kizu, Fujisawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed June 5, 1974, Ser. No. 476,703
Claims priority, application Japan, June 30, 1973, 48-73853
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **3 Claims**



1. A constant velocity universal joint comprising an inner race and an outer race between which balls are mounted in grooves for transmitting torque therebetween, a ball retaining cage positioned between said inner and outer races retaining said balls in a common plane, said cage having an outer surface formed with a part-spherical surface, the centers of radius of curvature of said part-spherical surfaces being equidistant from and on the opposite sides of the joint center, the inner surface of said cage and the outer surface thereof being in sliding engagement with the outer surface of said inner race and the inner surface of said outer race, respectively, the outer surface of said inner race being formed with a part-spherical surface having substantially the same center of radius of curvature to that of the part-spherical surface forming the inner surface of said cage and the inner surface of said outer race

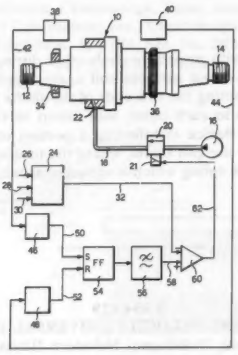
being formed with a part-spherical surface having substantially the same center of radius of curvature to that of the part-spherical surface forming the outer surface of said cage, said inner race being provided in the part-spherical surface thereof with ball-engaging grooves which are angled with respect to the inner race axis and said outer race being provided in the part-spherical surface thereof with ball-engaging grooves which are angled with respect to the outer race axis in the opposite direction.

3,934,430

ELECTRONIC INJECTION TIMING CONTROL FOR FUEL INJECTION PUMPS

Oscar Fuso, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed Mar. 6, 1974, Ser. No. 448,598
Int. Cl.² F02P 5/04; F16D 5/00
U.S. Cl. 64—25 **1 Claim**



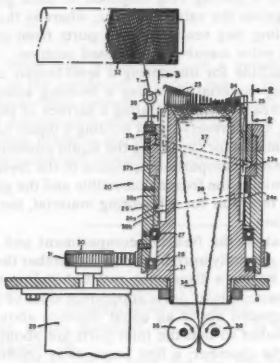
1. A fuel injection system comprising:
an injection pump having a pump drive shaft;
a driving shaft;
a helical sleeve coupling interconnecting said pump drive shaft and said driving shaft;
electronic circuit means adapted to be responsive to a number of operating parameters of an associated engine to provide a first output signal;
hydarulic actuator means controlled by said circuit for effecting axial displacement of said sleeve to vary the relative angular displacement between said shafts and thereby vary the fuel injection advance angle of said pump as a function of the said parameters;
a first ferromagnetic toothed wheel attached to said pump drive shaft so as to rotate therewith;
a second ferromagnetic toothed wheel attached to said driving shaft so as to rotate therewith, said second ferromagnetic wheel having the same number of teeth as said first ferromagentic tooth wheel;
first magnetic pick-up means disposed adjacent said first ferromagnetic wheel to generate a signal proportional to the rotation of said wheel;
second magnetic pick-up means disposed adjacent said second ferromagnetic wheel to generate a signal proportional to the rotation of said second wheel;
means for deriving a second output signal proportional to the relative angular displacement of the pump drive shaft and the driving shaft comprising first and second monostable multivibrators having their inputs connected to said first and second magnetic pick-up means respectively, a flip-flop having "set" and "reset" inputs connected to the outputs of the first and second monostable multivibrators, and a low-pass filter means connected to the output of the flip-flop to provide the second output signal;
differential amplifier means having its inputs connected to said electronic circuit means and said low pass filter means to provide a third output signal representative of the difference between said first and second output signals, said third output signal being a control signal to said hydraulic actuator means.

3,934,431

HIGH SPEED KNITTING MACHINE AND METHODS

Robert W. Westmoreland, Sr., Roanoke, Va., assignor to Fred Whitaker Company, Bala Cynwyd, Pa.

Continuation of Ser. No. 821,447, May 2, 1969, abandoned. This application Oct. 29, 1973, Ser. No. 410,807
Int. Cl.² D04B 15/00, 15/32
U.S. Cl. 66—57 **10 Claims**



1. A circular knitting machine for knitting yarn into a fabric having a needle cylinder, a complement of needles disposed in said cylinder for vertical movement, a complement of sliders disposed in said cylinder in alternation with said needles, and cam means extending substantially completely around said cylinder for longitudinally moving said needles and said sliders back and forth so that essentially throughout the entire knitting cycle each of said needles moves in a direction opposite to the direction of movement of the sliders which are adjacent to said needle said cam means providing substantially continuous vertical movement to said needles and sliders.

3,934,432

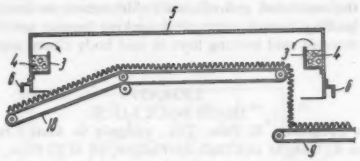
APPARATUS FOR THE CONTINUOUS STEAMING OF MAN-MADE FIBERS

Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

Division of Ser. No. 276,081, July 28, 1972, Pat. No. 3,838,968. This application Feb. 27, 1974, Ser. No. 446,339
Claims priority, application Germany, July 28, 1971, 2137759; Nov. 16, 1971, 2156764; Mar. 11, 1972, 2211792
Int. Cl.² D06B 3/02
U.S. Cl. 68—5 D **22 Claims**

18. An apparatus for the steam treatment of fibrous material which comprises at least one open hood-shaped steamer housing defining a steam bell and having an open bottom

extending across the housing, means for supplying steam within said housing, and means for transporting said fibrous



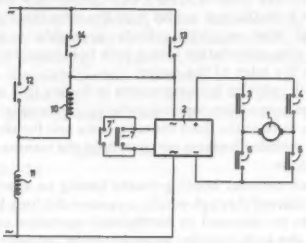
material from outside of said housing into the steam contained within said housing and then outside of said housing.

3,934,433

SWITCHING CONTROL FOR A REVERSING MOTOR OF A WASHING MACHINE

Yves Albert Daniel Thibaut, Amiens, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1974, Ser. No. 440,340
Claims priority, application France, Feb. 9, 1973, 73.04659
Int. Cl.² D06F *33/02*
U.S. Cl. 68—12 R 2 Claims



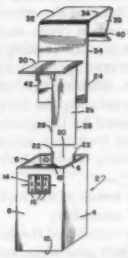
1. A device for switching a drum drive motor of a washing machine, comprising a pump motor having a first line connection and a switch connection; a drum drive motor; an electronic supply module having a first line connection and a switch connection, and output connections; timer contacts, including a pump motor contact having a second line and a motor connection, and a spin cycle contact having a second line and a module connection; a reversing switch assembly; means for connecting said drum drive motor to said electronic supply module output connections via said reversing switch assembly; means for driving the reversing switch assembly having first and second input connections; a delay contact having second line and motor connections; and means for connecting said first line connections together and said second line connections together and for connecting first and second line connections to a source of electric power; wherein said pump motor contact motor connection, pump motor switch connection and first input connection are connected together, and said delay contact motor connection, spin cycle contact module connection, electronic module switch connection and second input connection are connected together, whereby said delay contact and drive means for the reversing switch form a series circuit in parallel with the pump motor contact, and said delay contact and spin cycle contact are in parallel for supplying power to said electronic control module.

3,934,434

KEY SAFE APPARATUS

Jack Law, 910 Alakea St., Honolulu, Hawaii 96813

Filed Sept. 24, 1973, Ser. No. 399,739
Int. Cl.² E05B *65/52*
U.S. Cl. 70—63 17 Claims



1. A key safe apparatus comprising:

a receptacle box of a volume sufficient to enclose a door key, with four, generally rectilinear, vertical side walls and a bottom wall wherein a vertical side wall is formed with a slot structure running vertically downward from an upper edge of the vertical side wall, which slot structure has vertical edges bevelled in such a way that the slot structure is wider in a plane of an interior face of the vertical side wall than it is in a plane of an exterior face of the vertical side wall,

a tongued cover structure comprising a plate capable of covering the receptacle box and a bevelled tongue member attached to the plate and extending therefrom, which tongue member is formed with bevelled edges and which tongue member is wider in a plane of one principal face of the tongue member than it is in a plane of another principal face of the tongue member so that the tongue member may be keyed into the slot structure of the receptacle box,

a latching projection attached to the plate of the tongued cover structure and extending therefrom, and

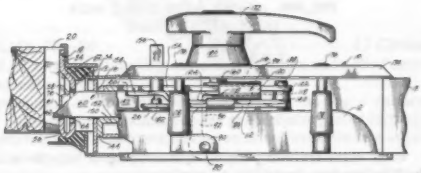
a code lock structure engaging the latching projection attached to the plate, whereby a door key is securely encased in a receptacle box with a tongued cover structure locked to a receptacle box by means of a code lock.

3,934,435

DOOR LOCKSET AND STRIKE

William F. Gresham, San Clemente, Calif., assignor to VSI Corporation, Pasadena, Calif.

Filed Sept. 26, 1974, Ser. No. 509,656
Int. Cl.² E05B *65/06*
U.S. Cl. 70—150 26 Claims



1. An improved lockset for mounting in a door and securing the door in a jamb, the lockset having a jamb end, an interior end opposite the jamb end, an outside for facing the outside of the door, and an inside for facing the inside of the door, the improvement comprising:

a. a monolithic body having a head with a straight line channel proximate the jamb end;

b. a lock bolt assembly in the channel of the body for translation along a path between a retracted and an extended position, the extended position having a portion of the lock bolt externally of the body on the jamb side thereof for receipt in a mortise of the jamb, the retracted position having the lock bolt withdrawn from the extended position for clearance of the mortise, the lock bolt assembly having U-shaped in cross section guides on the interior end of the lockset and facing the path;

c. a guide plte overlying the lock bolt assembly on the inside of the lockset, abutting the head of the body and secured to the body, capturing the lock bolt assembly in the channel, and received by the guides for maintaining the interior end of the lock bolt assembly along the path;

d. means for biasing the lock bolt assembly into its extended position;

e. means on the inside of the lockset for manually retracting the lock bolt assembly;

f. means on the outside of the lockset for manually retracting the lock bolt assembly; and

g. means for locking and unlocking the lockset from either side thereof.

24. For use in a door jamb to receive a lock bolt of a lockset mounted in a door, an improved strike comprising:

a one-piece member having ends adapted to be mounted to the door jamb, a medial section raised from a plane containing surfaces of the ends, a curl in the medial section for transit bearing with a lock bolt upon closing of the door,

the curl having a convex outward curvature, a mortise in the medial section having a primary and a secondary lock bolt bearing surface, the secondary surface being a redundant surface to keep a lock bolt upon failure of the primary surface, a pair of spaced apart retaining sections in the medial section, each retaining section having a slot for receipt of a shank of an interlock attached to the lockset, a head of the interlock residing behind the retaining section for interference therewith upon loads in the jamb and the door tending to separate the two.

3,934,436

STANDARD FOR PARKING AND LOCKING A BICYCLE

Francis T. Candlin, 280 Madison St., and Michael D. Candlin, 2737 E. 13th Ave., both of Denver, Colo. 80206

Filed Mar. 29, 1974, Ser. No. 456,359
Int. Cl.[2] B62H *5/00*; E05B *73/00*
U.S. Cl. 70—234 **10 Claims**

1. A standard for parking and locking a bicycle with a locking means comprising in combination:

a a tubular post upstanding from a surface and having a cable-attaching portion on the post;

b a body clamp means outstanding from the post to engage and clamp upon the tubular frame portion of a bicycle and including a locking hole means therein to receive said locking means, and

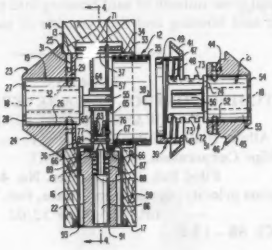
c cable means having one end extending from the cable-attaching portion and being of a length to be interwoven through both wheels of a bicycle held by the body clamp and to terminate at its extended end adjacent to said locking hole means, said cable means including an eye at the extended end of said cable means to receive said locking means when said locking means are inserted through said locking hole in said body clamp means.

3,934,437

DOOR BOLT LOCK

Alois Crepinsek, El Paso, Tex., assignor to Alois Crepinsek; Lee A. Chagra and Dafe McFadden, all of El Paso, Tex.

Filed Dec. 12, 1974, Ser. No. 531,927
Int. Cl.[2] E05B *9/08*
U.S. Cl. 70—370 **12 Claims**



1. In a door bolt lock:

lock cylinder housing means to be disposed within a transverse bore through a door near the edge thereof for housing at least one lock cylinder assembly in mechanical operative association with a lock bolt assembly to extend from the edge of the door;

said lock cylinder housing means including first and second flange means for capturing the lip portions of the transverse bore in the door therebetween and for securing said lock cylinder housing means within the transverse bore of the door;

said lock cylinder housing means having an aperture in the side thereof through which to receive the lock bolt assembly to be disposed in mechanical operative engagement with the lock cylinder assembly to be carried within said lock cylinder housing means;

said lock cylinder housing means having first and second axially separable housing portions including said first and second flange means, respectively; and

threaded coupling means for operative association with said first and second housing portions for coupling said first and second housing portions together and including mateable tubular threaded portions such that relative rotation between said mateable threaded portions produces axial translation of one of said housing portions relative to the other.

3,934,438

METHOD OF LONG-EDGE SHAPE CONTROL FOR TANDEM ROLLING MILL

Tohru Arimura, Yokohama; Masaru Okado, Tokyo; Takarokuro Ichimaru, and Masamoto Kamata, both of Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

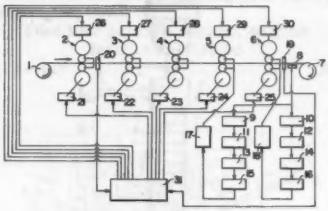
Continuation of Ser. No. 409,684, Oct. 25, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,787
Claims priority, application Japan, May 9, 1973, 48-51465
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—9 **8 Claims**

1. A method of product-shape control carried out during rolling of a strip by a tandem rolling mill having a plurality of tandem-arranged adjacent rolling stands, comprising:

determining a shape influence coefficient which is a function of at least the dimensions of the tandem mill, schedule of roll passes and elastic deformation of the stands and rolls;

detecting, during rolling, the long-edge shape of the strip at the delivery side of the final stand in stand tandem mill;

producing a signal corresponding to said detected long-edge shape; and



adjusting the roll bending force for at least two latter stands, but not all stands, in said tandem mill as a function of said signal and as a function of said shape influence coefficient to control the shape of the strip without producing variations in the thickness of the strip at said delivery side of said final stand, and without producing variations in the inter-stand tension between each pair of adjacent stands.

3,934,439

DRAW-BENDING APPARATUS AND METHOD

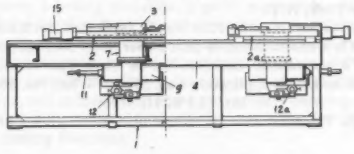
Horst Kirschstein, Wuppertal; Frank Rabenschlag, Solingen; Dieter Lotz, Wuppertal; Gerhard Holland-Cunz, Wuppertal, and Hans Blomberg, Wuppertal, all of Germany, assignors to Gebr. Happich GmbH, Germany

Filed Apr. 1, 1974, Ser. No. 456,845

Claims priority, application Germany, Apr. 7, 1973, 2317540

Int. Cl.² B21D *11/02*

U.S. Cl. 72—21 **7 Claims**



1. Apparatus for draw-bending a workpiece comprising, in combination:

first and second spaced bending tables each rotatable about respective spaced, parallel axes;

tool holder means connected to and rotatable with said first and second spaced bending tables; said tool holder means being connectable to a workpiece to be bent in response to the rotation of said first and second bending tables; the space between said tool holder means of said first and second spaced bending tables being free of intervening mechanism thereby to permit the free suspension of a workpiece between said tool holder means of said first and second bending tables;

operating means connected to said first and second bending tables for rotating said first and second bending tables;

control means connected to said operating means for establishing the angle of rotation of each of said first and second bending table;

said first and second bending tables being rotatable through different respective angles by said operating means;

means connecting said first and second bending tables to one another for rotating said bending tables through different angles of rotation simultaneously during an identical time period.

3,934,440

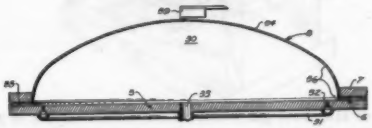
MEANS AND METHOD OF FORMING SHEET METAL

John W. Berg, 1111 Morse Ave., Space 35, Sunnyvale, Calif. 94086

Continuation of Ser. No. 145,397, May 20, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 394,280

Int. Cl.² B21D *26/04*

U.S. Cl. 72—54 **5 Claims**



1. Means for shaping sheet metal, comprising:

a. a pair of opposed marginal members for receiving the margin of a sheet metal work piece therebetween;

b. a backing member for the work piece joined to one of the marginal members and forming with the work piece a pressure chamber;

c. guide means confronting the outer periphery of the marginal members and permitting translational movement of the marginal members and work piece as a unit relative thereto;

d. a plurality of clamp units disposed about the marginal members, each clamp unit including the guide means, a pair of opposed clamp members relatively movable to clamp the marginal members and the work piece therebetween, and means for effecting relative movement of the clamp members;

e. means for introducing pressure fluid into the pressure chamber to distend the work piece with respect to the backing member; and

f. means for individually controlling the clamping force exerted by each clamp unit to permit controlled slippage of the margin of the work piece with respect to the marginal members; including means for sensing slippage of the work piece in selected regions.

3,934,441

CONTROLLED ENVIRONMENT SUPERPLASTIC FORMING OF METALS

Charles Howard Hamilton, San Pedro; Fred B. Koeller, Manhattan Beach; Roger S. Raymond, Redondo Beach, and Martin Goldberg, Valencia, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed July 8, 1974, Ser. No. 486,290

Int. Cl.² B21D *26/04*

U.S. Cl. 72—60 **17 Claims**

1. A method of making metallic forms in a controlled environment comprising:

providing at least one shaping member having a surface formed complimentary to the shape desired to be formed;

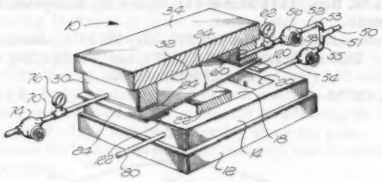
providing a metal blank having an effective strain rate sensitivity and two opposed principal surfaces;

enclosing an area around said metal blank and said at least one shaping member, said enclosed area being divided into first and second chambers by said metal blank, said metal blank being positioned as a diaphram between said chambers, said at least one shaping member being located in said first chamber;

providing an inert gas environment in said chambers;

heating said metal blank to a temperature suitable for superplastic forming; and

controlling the fluid pressure of said inert gas within said chambers to induce a pressure loading across the principal surfaces of said metal blank wherein the fluid pressure



of said inert gas within said second chamber is greater than the fluid pressure of said inert gas within said first chamber, thereby causing said metal blank to deform into said first chamber and against, and into intimate contact with, said at least one shaping member.

3,934,442

PRESS FOR HYDROSTATIC EXTRUSION

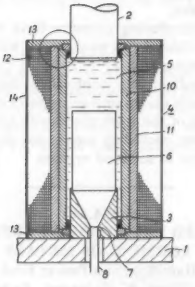
Hans Larker, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Aug. 15, 1974, Ser. No. 497,834

Claims priority, application Sweden, Sept. 5, 1973, 7312058

Int. Cl.² B21C *27/00*

U.S. Cl. 72—60 **2 Claims**



1. A high pressure apparatus with a pressure chamber having a high pressure cylinder comprising an inner tube **10** (liner) surrounded by a prestressed supporting member **11** and intended to enclose a pressure medium, a member projecting into the high pressure cylinder, a seal assembly comprising a seal holder **13, 18** at the end of the pressure chamber, first **21** and second **26** sealing rings of metal, the first ring having an inner cylindrical surface **22** making contact with the member projecting into the cylinder and an end surface **24** making contact with the seal holder, the second ring **26** having an outer surface **27** making contact with the cylinder wall and an end surface **28** making contact with the seal holder, the end surface of the inner tube being inwardly inclined towards the tube center and the seal holder having an inclined end surface abutting the inclined end surface of the inner tube.

3,934,443

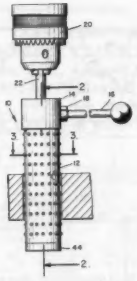
PEENING TOOL

David P. Keen, 2115 Robinson St., Redondo Beach, Calif. 90278

Filed Jan. 3, 1975, Ser. No. 538,301

Int. Cl.² B21J *7/16*

U.S. Cl. 72—75 **18 Claims**



1. A peening tool comprising:

a solid cylindrical body having a centrally located hollow portion defining a given body thickness,

a plurality of holes in said body thickness located radially in said cylindrical body,

said holes having a reduced diameter near the peripheral portion of said hollow cylindrical body,

a spherically shaped ball located in each of said holes and having a diameter less than the largest diameter of said hole but greater than said reduced diameter and greater than said body thickness, and

a rotatable driver body located within said hollow cylindrical body and having a plurality of individual rotatable hammers adapted to sequentially contact said balls.

3,934,444

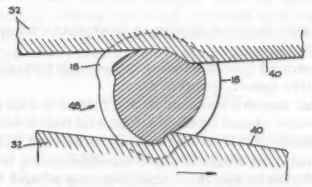
METHOD AND APPARATUS FOR FORMING VIBRATION-RESISTANT THREAD-FORMING SCREW

Leon Simons, New City, N.Y., assignor to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 251,023, May 8, 1972, Pat. No. 3,850,074, which is a continuation-in-part of Ser. Nos. 54,716, July 14, 1970, abandoned, and Ser. No. 007,280, Jan. 30, 1970, abandoned. This application Aug. 29, 1974, Ser. No. 501,801

Int. Cl.² B21H *3/06*

U.S. Cl. 72—88 **5 Claims**



1. A thread forming die for rolling lobed thread-forming screws from circular shanks, said die comprising a hardened block shaped along a working surface thereof with thread-forming indentations having cross-sections corresponding to a desired formed thread cross-section, said thread-forming indentations each being undulated with respect to the plane of said working surface, with the undulations being arranged in columns extending across the indentations, said columns extending at an acute angle with respect to the direction of die movement, said acute angle being related to the spacing of

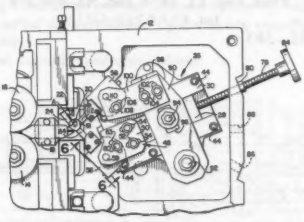
said undulations such that a line drawin perpendicular to the direction of die movement will intercept corresponding points along undulations in at least two different columns so that a screw shank rolled by said die will at all times be engaged by the highest points of at least two undulations.

3,934,445

DUAL PURPOSE SPRING COILING MACHINE

Bernard Lampietti, Goshen, Conn., assignor to Torin Corporation, Torrington, Conn.

Filed June 24, 1974, Ser. No. 482,089
Int. Cl.² B21F *11/00*
U.S. Cl. 72—129 **29 Claims**



1. In a dual purpose spring coiling machine, the combination of an upstanding main supporting frame, feed means on said frame for intermittently advancing spring wire in a horizontal longitudinal direction, a spring coiling station at a front portion of said frame, a wire guide means on said frame between said feed means and coiling station, an arbor on said frame at said coiling station and projecting laterally and generally horizontally forwardly and which is adapted to engage wire advanced longitudinally past said guide means by said feed means, a pritch tool supported by said frame at said coiling station and engageable with and operable laterally to displace wire advanced longitudinally by said feed means, a spring cut-of tool supported by said frame and movable toward and away from said coiling station, and a coiling tool slide assembly arranged on a side of said arbor generally opposite said feed means and wire guide means, said assembly comprising a coiling tool slide, a guide mountable selectively on said frame in at least two discrete angularly related positions, said guide being adapted to support said slide for rectilinear movement in one and an opposite direction and toward and away from said coiling station at each of its said discrete positions, and at least two coiling tool holders carrying coiling tools and mountable selectively on said slide for different spring coiling functions.

3,934,446

METHODS OF AND APPARATUS FOR PRODUCTION OF WIRE

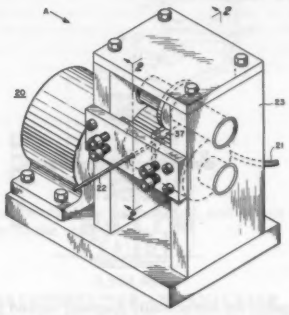
Betzalel Avitzur, 817 N. 31st St., Allentown, Pa. 18104

Filed Apr. 16, 1974, Ser. No. 461,307
Int. Cl.² B21B *21/00*
U.S. Cl. 72—206 **22 Claims**

11. Apparatus for forming wire comprising:

a. Means for passing an incoming rod of material having a first cross-sectional area through a pair of opposed members which rotate about parallel axes, wherein said opposed rotating members have external cylindrical surfaces which cooperate so as to form a second cross-sectional area in the plane common to said axes, said second cross-sectional area being less than that of said first cross-sectional area so that said rotating members upset said incoming rod in a rolling manner; and

b. A die adjacent said plane and having an orifice aligned with said second cross-sectional area; said die orifice blocking discharge from said second cross-sectional area so that the rod moves directly into said die orifice, said die orifice being spaced from said plane by a distance substantially less than the radius of said members; said



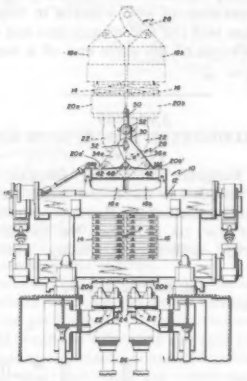
members having sufficient frictional contact with said rod so that said rod may be extruded through the die orifice to form wire.

3,934,447

VERTICAL ROLL CHANGING APPARATUS

Robert R. Brodeur, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Jan. 10, 1975, Ser. No. 540,157
Int. Cl.² B21B *31/08*
U.S. Cl. 72—239 **5 Claims**

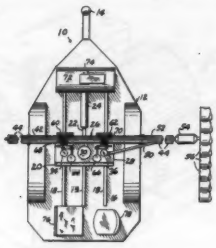


1. In a rolling mill having a housing containing a roll assembly which includes a pair of vertical rolls with the upper and lower roll necks of each roll journalled respectively in upper and lower laterally spaced bearing chocks, a carrying assembly for use in vertically moving the said roll assembly into and out of the said housing said carrying assembly comprising: a carrying member and first and second link members; first pin means for connecting said first and second link members to said carrying member at a common central location; second pin means for pivotally connecting said first and second link members to the upper bearing chocks of the roll assembly; and, third pin means on said carrying member at a lower central location spaced beneath said first pin means, said third pin means being engageable with oppositely inclined surfaces on said first and second link members.

3,934,448
RACKED PIPE REAMER

Lowal L. Hand, 416 S. 4th, Clinton, Okla. 73601

Filed Nov. 25, 1974, Ser. No. 527,184
Int. Cl.² B21D 5/02
U.S. Cl. 72—380 6 Claims

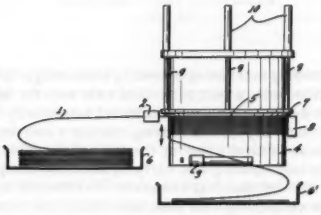


1. A reamer for horizontally disposed racked tubular members, comprising:
- an elongated mobile frame including a substantially horizontal base;
- a platform longitudinally slidably overlying said base;
- platform moving means for moving said platform relative to said base;
- trough means extending transversely of said base in vertically spaced relation above said platform;
- elevating means for raising and lowering said trough means;
- a reamer rod slidably supported by said trough;
- a reamer connected with one end of said rod;
- a pair of winches each having a flexible element connected with one end of said rod in cooperative opposition; and,
- means including motors for operating said winches, whereby operation of said winches in sequence alternately pushes said rod and reamer into and through and pulls it back out of the same end of a racked tubular member.

3,934,449
DRAWING ELONGATED STOCK, SUCH AS COPPER TUBING

Otto Uhlmann, Burgdorf, and Norbert Stephan, Ahlem, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Mar. 10, 1975, Ser. No. 557,107
Claims priority, application Germany, Mar. 23, 1974, 2414134
Int. Cl.² B21C 1/02
U.S. Cl. 72—289 3 Claims



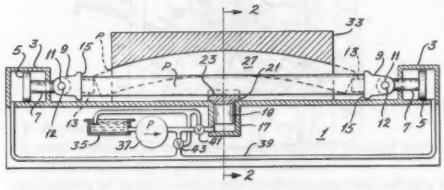
1. In a machine for drawing elongated stock such as copper tubing or the like and having a drawing die and a drum rotating on a vertical axial and onto which stock drawn by and through the die is wound and which draws the stock through the die, there being a clamp on the drum for holding the end of the stock, the improvement comprising a slightly obliquely positioned annulus, axially movably disposed on the drum; and

means for displacing the annulus to assume a first position in which it places the stock as drawn through the die for positioning on the drum, while pushing coiled stock down, and a second position of retraction to enlarge the capacity of the drum without dislodging the stock as coiled thereon.

3,934,450
METHOD AND APPARATUS FOR BENDING ELONGATED MEMBERS

Winthrop B. Reed, St. Louis, Mo., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Aug. 12, 1974, Ser. No. 496,374
Int. Cl.² B21D 5/02
U.S. Cl. 72—383 12 Claims



1. The method of bending an elongated member comprising the steps of positioning the elongated member between a pair of parallel surfaces normal to the axis of the proposed bend and spaced apart sufficiently to closely receive the width of the elongated member between them, initiating application of longitudinal compressive loads to opposite ends of the elongated member, applying a transverse load in a direction radially outwardly of the direction of the proposed bend to the intermediate region of the elongated member, ceasing application of such transverse load prior to substantial bending of the elongated member, and continuing application of such longitudinal compressive loads after cessation of application of said transverse load, to complete the bending operation.

3,934,451
METHOD OF DETECTING IMPERFECTIONS IN A HEAT-INSULATING LINING

Paul Bristoll, and Godefridus Arink, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 29, 1973, Ser. No. 364,394
Claims priority, application Netherlands, June 2, 1972, 7207473
Int. Cl.² G01N 25/72
U.S. Cl. 73—15 FD 6 Claims

1. A method of detecting imperfections in a heat-insulating lining of foamed material of a wall enclosing a space suitable for cryogenic uses, comprising locally cooling the surface of the lining by scanning with a jet of cooled gas and observing the lining for imperfections in the cooled state.

3,934,452
METHOD OF DETERMINING DYNAMIC STRAINS IN COMPOSITE STRUCTURES

Dusan Cyril Prevorsek; Young Doo Kwon, and Raj Kumar Sharma, all of Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,610
Int. Cl.² G01N 3/32
U.S. Cl. 73—15.6 5 Claims

1. Method of determining the strain amplitudes of the two principal components of a structure composed principally of two viscoelastic materials A and B at least one of which shows non-linear viscoelastic behavior under strain, due to cyclic

straining of the structure with heat generation, comprising the following steps:

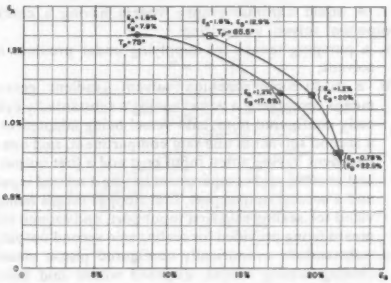
1. Experimentally determining rates of heat generation, Q, per unit volume of each material, due to cyclic straining, for each material at a series of temperatures by hysteresis measurements at various strain amplitudes (ϵ_A) for material (A) and (ϵ_B) for material (B);
2. Calculating by computer for each pair of a set of pairs of strain amplitudes (ϵ_A, ϵ_B), the steady-state temperatures at two positions (P) and (P′) in the structure, using finite difference approximations at successive positions through the structure, to solve the heat balance equation appropriate for the particular structure, having as its simplest form:

$$\sigma C_p \partial T/\partial t = K \partial^2 T/\partial q^2 + Q$$

where ∂ / ∂ t indicates partial differentiation by time; ∂ / ∂ q indicates partial differentiation by the space coordinate;

σ = density

C_p = heat capacity per unit volume



T = temperature

K = coefficient of thermal conductivity

Q = heat generation rate per unit volume, at the temperature calculated for each volume element dV and at the value of strain amplitude (ϵ_A) or (ϵ_B) imposed upon the material (A) or (B);

3. Representing the calculated set of temperatures at (P) as a function of strain amplitudes, ϵ, of one of the materials for each value of the other ϵ, and likewise representing the calculated set of temperatures at (P′);
4. Experimentally determining steady-state temperatures TP and T_P' at positions (P) and (P′) of the structure as it undergoes the specified straining cycle;
5. Representing the curve of ϵ_A vs. ϵ_B at the temperature T_P and an likewise the ϵ_A vs. ϵ_B curve at the temperature T_P' using the data revealed by step (3) above;
6. Observing the intersections of the two curves revealed by step (5) above, thereby determining a pair of strain amplitudes (ϵ_A, ϵ_B) imposed by the cyclic straining, which pair of amplitudes will give rise to the experimentally determined temperatures T_P and T_P'.

3,934,453

CONSERVATOR SYSTEM

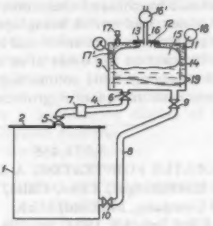
Petter Hessen, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 25, 1974, Ser. No. 518,151

Int. Cl.² G01D *7/04*; H01G *5/04*; H02G *15/26*

U.S. Cl. 73—19 **6 Claims**

1. Conservator system for apparatus filled with oil which is saturated with a non-combustible gas, comprising a conservator tank, means connected with the conservator tank for circulation of oil through an inlet from the upper portion of the apparatus and an outlet to the lower portion of the apparatus, in which free non-combustible gas is present in an upper portion of the conservator tank above the oil level therein, an elastic diaphragm (14) in the conservator tank separating the oil and free non-combustible gas located above the oil level from the atmosphere, thereby providing a space on the side of



the diaphragm facing away from the oil, and means connecting said space to the atmosphere.

3,934,454

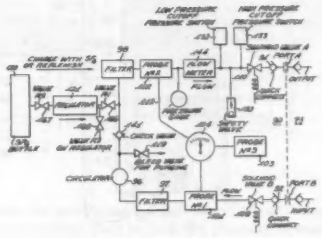
GAS CONDITIONER AND ANALYZER

Stephen G. Simo, Rockland, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 4, 1974, Ser. No. 529,349

Int. Cl.² G01N *31/00*

U.S. Cl. 73—29 **7 Claims**



1. A portable gas conditioner and analyzer for gas insulated substations comprising:

a two wheeled cart having handle means for facilitating the handling of the gas conditioner and analyzer by a single operator;

a cabinet mounted on said cart;

a gas circulator having an inlet side and an outlet side mounted within said cabinet;

an inlet gas circuit means connected to the inlet side of said gas circulator, said inlet gas circuit means being connectable to the gas insulated substation to provide a gas flow circuit between the substation and said circulator;

an outlet gas circuit means connected to the outlet side of said circulator, said outlet gas circuit means being connectable to the gas insulated substation to complete a closed gas circuit;

a first electronic sensor connected to said inlet gas circuit means operable to monitor the moisture content and the temperature of the gas as it flows from the gas insulated substation to said circulator;

a second electronic sensor connected to said outlet gas circuit means operable to monitor the moisture content and the temperature of the gas as it flows from said circulator to the gas insulated substation;

a first gas filter in the inlet gas circuit means, said first gas filter being operably disposed to filter the gas prior to said gas flowing to said circulator and after said gas is monitored by said first monitoring means;

a second gas filter in the outlet gas circuit means, said second gas filter being operably disposed to filter gas directly after the gas leaves said circulator;

a hygrometer-thermometer supported in said cabinet and having a moisture indicating scale and a temperature indicating scale including a switch normally positioned to connect said hygrometer-thermometer to indicate on one of said scales, said switch being operable when actuated to another position to connect said hygrometer-thermometer to indicate on the other of its scales; and,

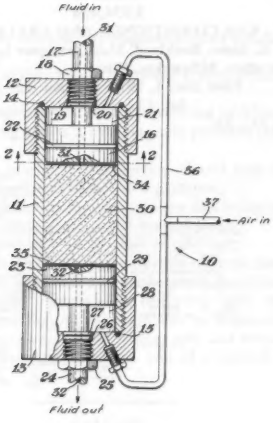
individual means operably connecting said first and second electronic sensors to said hygrometer-thermometer.

3,934,455

APPARATUS FOR TESTING A SAND SAMPLE

William H. Harrisberger, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 13, 1974, Ser. No. 442,283
Int. Cl.² G01N *15/08*
U.S. Cl. 73—38 **1 Claim**



1. A method for testing a sand sample from a subsurface earth formation, which comprises the steps of:

placing an unconsolidated sand sample in a rigid, closed cylindrical vessel;

compacting the unconsolidated sand sample within the vessel to obtain a uniform pack by compressing the sample between a first piston and a second piston, the pistons being slidable toward each other within the vessel; and the diameter of the vessel, as related to the length of the sand sample, being a ratio of not more than 1 to 2;

passing a first fluid through the compacted unconsolidated sand sample to determine flow permeability of the unconsolidated sand sample;

passing a second and third fluids through the compacted, unconsolidated sand sample to condition the sand particles for accepting a fourth fluid which defines a consolidating fluid;

directing the consolidating fluid into the sand sample to adhere the sand particles together, to thereby consolidate the sand sample;

flushing the consolidated sand sample with a fifth fluid to remove consolidating fluid which is trapped in pore spaces between the sand particles;

curing the consolidating fluid by heating the vessel to a temperature sufficient to cure the said consolidating fluid; and

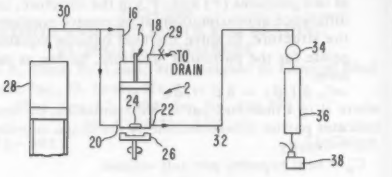
passing a sixth fluid through the compacted, consolidated sand sample to determine the flow permeability of the said consolidated sample.

3,934,456

SOLVENT GRADIENT GENERATOR FOR CHROMATOGRAPHY SYSTEMS

Miner N. Munk, Walnut Creek, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed July 22, 1974, Ser. No. 490,549
Int. Cl.² G01N *31/08*
U.S. Cl. 73—61.1 C **22 Claims**



1. A liquid chromatography system having a controlled component solvent comprising:

a. a pumping means for supplying under pressure a first solvent;

b. a multi-compartmented solvent gradient generating means comprising a vessel having a substantially cylindrically configured bore, said vessel being adapted to have a second solvent in one said compartment, said one compartment having a first input port and a first output port, and another said compartment having a second input port and a second output port, first stopper means being provided for sealing said first input port, and second stopper means being provided for sealing said second output port;

c. substantially cylindrically configured piston means, including sealing means, disposed within said bore and sealably extending outside said vessel, said piston means having a piston head slidably contained within said gradient generating means for defining in combination with said vessel said one compartment adjacent one side of said head and said another compartment adjacent the other side thereof;

d. column means, including injector means, for selectively interacting said controlled component solvent with a stationary reactive element disposed within said column means;

e. control means for controlling the rate of movement of said piston head within said bore; and

f. mixing means coupling said first output port commonly with said second input port and with said pumping means for supplying said solvent having controlled component mixtures to said column means.

3,934,457

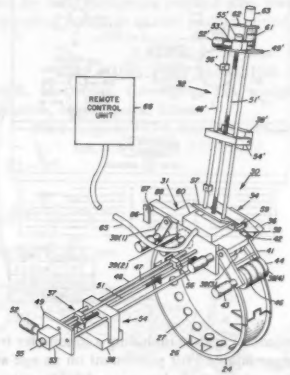
VESSEL NOZZLE INSPECTION APPARATUS

Jack Phillip Clark; Thurman Dale Smith, and Alan Carl Foster, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jan. 13, 1975, Ser. No. 540,679
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **24 Claims**

1. Remotely operable apparatus for inspecting the connection of a pipe to the wall of a vessel, said connection being formed by an attachment nozzle, said nozzle having a flange-like inner end welded by an inner weld within an aperture in said vessel, a generally cylindrical body portion extending outward from said vessel, a curved inner radius portion between said inner end and said body portion, and an outer end portion welded by an outer weld to said pipe, said apparatus comprising: a circular track positioned around said body portion of said nozzle, said track being formed of magnetic material; a vehicle adapted to run on said track said vehicle including a frame, a pair of wheels journalled in said frame, said wheels including permanent magnet means for adherence

of said wheels to said track, selectively operable drive means for said wheels for driving said vehicle around said track, an outer arm attached to said frame and extending therefrom generally parallel to said pipe, a first carriage mounted on said outer arm, said outer arm including first guiding means for guiding said first carriage back and forth along said arm, a first transducer block including at least one transducer for transmitting and receiving inspection signals, first attachment means for attaching said first transducer block to said first carriage, said outer arm including selectively operable drive means engaging said carriage for moving said first transducer block back and forth along said first guiding means across said

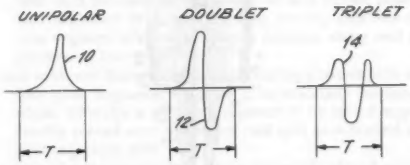


outer weld; an inner arm attached to said frame and extending therefrom generally parallel to said wall of said vessel, a second carriage mounted on said inner arm, said inner arm including second guiding means for guiding said second carriage back and forth along said arm, a second transducer block including at least one transducer for transmitting and receiving inspection signals, and second attachment means for attaching said second transducer block to said second carriage, said inner arm including selectively operable drive means engaging said second carriage for moving said second transducer block back and forth along said second guiding means across said inner weld.

3,934,458
METHOD AND APPARATUS FOR PULSE ECHO IMAGING

Irwin Beretsky, New City, and Bernard Lightenstein, Yorktown Heights, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,156
Int. Cl.² G01N *29/00*
U.S. Cl. 73—67.9 **22 Claims**

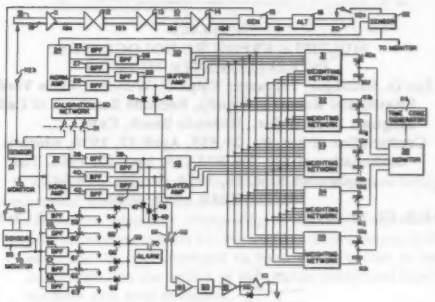


1. A method for pulse echo processing comprising, the steps of, interrogating a layered material with energy pulses of controlled waveform, receiving the pulse echoes which result from the interrogation of said layered material, operating upon said pulse echoes to provide a pulse echo waveform comprising a plurality of echo pulses, each of said echo pulses including a pulse portion which indicates the phase of the change in impedance, if any, between said material layers, generating the echo response of said layered material to said energy pulses from said pulse echo waveform to thereby preserve said phase change indications, generating the impulse response of said layered material by compensating said echo response to satisfy at least two known impedance conditions of said layered material, and further processing said impulse response to produce a quantitative display of the relative impedances of said layered material.

3,934,459
TORQUE MONITORING SYSTEM FOR ROTATING SHAFT

John F. Wolfinger; Robert Quay, both of Schenectady, and Joseph Tecza, Elnora, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,646
Int. Cl.² G01H *1/10*
U.S. Cl. 73—70.1 **10 Claims**



1. Apparatus for producing a signal proportional to oscillating torque in a rotating shaft including a plurality of mass and shaft sections, said apparatus comprising:

sensor means for providing a first signal representative of torsional oscillations of said shaft;

filter means connected to receive said first signal for passing predetermined frequency components of said first signal; and,

means connected to said filter means for multiplying each of said predetermined frequency components by a constant to produce second signals proportional to torque at each of said shaft sections.

3,934,460
APPARATUS FOR FOCUSING AND COLLIMATING ULTRASONIC WAVES

Leo H. Sherwin, Schenectady, and Robert S. Gilmore, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,893
Int. Cl.² G01N *29/04*
U.S. Cl. 73—71.5 US **19 Claims**

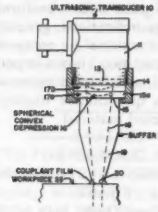
5. An ultrasonic testing apparatus for transmitting ultrasonic waves to a workpiece comprising:

a housing including a transducer comprising a planar active element for generating ultrasonic waves;

a buffer rod attached to said housing for contacting said workpiece; and,

means for focusing said ultrasonic waves, said focusing means disposed between said transducer and the end of the rod remote from the contact end of said buffer rod; said focusing means including at least one lens element having at least one liquid-filled depression and the acous-

tic impedance of the liquid closely matches the acoustic impedance of the buffer rod, said ultrasonic waves being



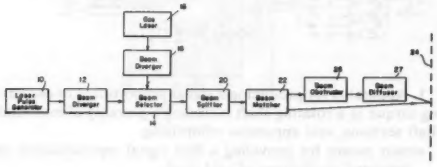
transmitted to said workpiece without requiring said apparatus or the workpiece to be submerged in a liquid.

3,934,461

MULTIPLE EXPOSURE HOLOGRAPHIC INTERFEROMETER METHOD

Lee O. Heflinger, Torrance; Ralph F. Wuerker, Palos Verdes Estates, and Robert E. Brooks, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 29,555, April 17, 1970, which is a continuation of Ser. No. 573,115, Aug. 17, 1966. This application Sept. 16, 1974, Ser. No. 506,642
Int. Cl.² G01B *11/16, 9/02*
U.S. Cl. 73—71.3 **9 Claims**



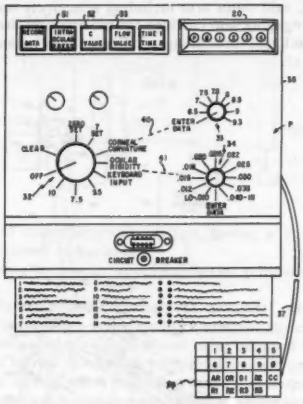
1. A method comprising the steps of:
a. generating a pulsed laser energy beam;
b. splitting said laser energy beam into a pair of beams;
c. directing one of said pair of beams through an unperturbed object space;
d. superposing said pair of beams;
e. exposing radiation sensitive material to said pair of superposed beams during generation of one pulse of said pulsed laser energy beam to make an image record;
f. exposing radiation sensitive material to said pair of superposed beams during generation of another pulse of said pulsed laser energy beam to make another image record;
g. directing one of said pair of beams during generation of one of said pulses through a perturbed object space;
h. processing said radiation sensitive material to convert said image records to visible images to form a hologram;
i. generating a continuous laser energy beam;
j. splitting said continuous laser energy beam into another pair of beams;
k. superposing said other pair of beams to occupy positions corresponding to positions occupied by said pair of beams;
l. obstructing the beam of said other pair of beams corresponding to said one beam wherein said object space was positioned; and
m. positioning said hologram for viewing in the other beam of said pair of beams in the same position occupied by said radiation-sensitive material when exposed.

3,934,462

AUTOMATIC COMPUTING OCULAR TONOMETER SYSTEM

Richard F. Rende, Maywood, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Sept. 6, 1974, Ser. No. 503,950
Int. Cl.² A61B *3/16*
U.S. Cl. 73—80 **22 Claims**



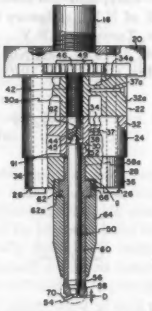
17. In a tonometer system including a tonometer transducer having a plunger adapted for placement on an eye and a foot plate slidably receiving said plunger, and analog circuit means for generating a signal representative of the location of said plunger relative to said foot plate, the improvement comprising: a handpiece for use by a clinician in placing said transducer means in test relation to an eye; visual indicator means on said handpiece and readily observed by said clinician without diverting his attention from a test; and handpiece control logic circuit means for controlling said visual indicator means to indicate to a clinician the status of the test.

3,934,463

HARDNESS TESTER

Adrian Dean Venderjagt, 4075 State St., Bridgeport, Mich. 48722

Filed Feb. 28, 1974, Ser. No. 446,967
Int. Cl.² G01N *3/42*
U.S. Cl. 73—81 **19 Claims**



1. Hardness testing apparatus comprising:
workpiece penetrating means for penetrating a workpiece to be tested;

means mounting said workpiece and said penetrating means for relative movement between spread positions and engaged positions in which said penetrating means penetrates said workpiece;

load bearing stop means engageable with said workpiece for positively physically interrupting said relative movement of said penetrating means and said workpiece after said penetrating means has penetrated said workpiece to a predetermined depth by transmitting any additional force which tends to move said workpiece and penetrating means together directly to said workpiece via said stop means; and

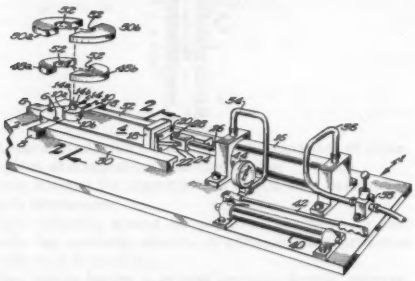
means for determining the load exerted on said penetrating means by said workpiece independently of any load exerted by said workpiece on said stop means when said penetrating means is at said pedetermined depth.

3,934,464

PIPE RING TEST MACHINE

Claudius R. McCauley, Covington, La., assignor to Apache Corporation, Minneapolis, Minn.

Filed Aug. 6, 1974, Ser. No. 495,241
Int. Cl.² G01N 3/08, 3/28
U.S. Cl. 73—95 **6 Claims**



1. A test machine for simulating a burst pressure test and applying tensile stress to a ring segment cut from a pipe section comprising:

a round post split along a parting line to define two half post segments;

stationary mounting means to which a stationary one of said post segments is rigidly affixed;

movable mounting means to which the other, movable one of said post segments is affixed, said movable mounting means being connected to power actuating means for movement towards and away from said stationary post segment along a displacement line substantially perpendicular to said parting line, said movable post segment being shiftable with said movable mounting means between a closed position abutting against said stationary post segment and an open, extended position displaced therefrom by operation of said power actuating means, whereby a ring segment cut from a pipe section of predetermined diameter may be placed around said split post with said movable post segment in said closed position and subjected to tensile stress by moving said movable post segment towards said open position along said displacement line; and

said split post being in a free, upstanding position with said half post segments lying in a substantially horizontal plane, whereby a pipe ring segment to be tested may be readily placed over the top of said split post around said post segments; and

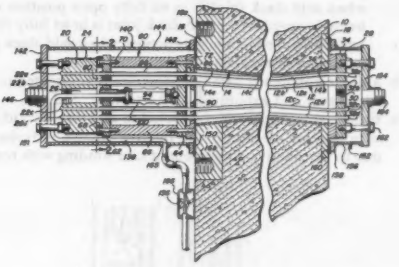
a pair of semicircular shoe discs removably placed around said split post on said base plates in abutting contact with each other along said split post parting line, each of said shoe discs having an inner, semicircular recess of a diameter substantially equal to that of said split post, whereby said shoe discs will fit snuggly around said split post, and each of said shoe discs having an outer diameter substantially equal to that of a particular pipe ring segment to be tested, whereby such shoe discs of varying outer diameters may be removably placed on said split post to permit the testing of a wide range of sizes of pipe ring segments greater in diameter than said split post.

3,934,465

POST-TENSIONING LOAD CELL

John Arvid Hanson, Mt. Prospect, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,655
Int. Cl. G01l 5/10
U.S. Cl. 73—143 **12 Claims**



1. An apparatus for measuring changes in a structure being compressed, comprising in combination:

1. a tendon assembly comprising a multiwire structural post-tensioning tendon having a stop member mounted at each end thereof arranged to have the structure to be compressed by the action of the tendon positioned intermediate said stop members,

2. a load cell for detecting changes in tensile loading of said tendon, comprising an elastically deformable tubular support member having a pair of spaced-apart end elements mounted thereon, one of said stop members being operatively connected to one end of said support member, whereby force applied to said stop member by said tendon causes axial deformation of said support member, and

3. telemetric means responsive to dimensional changes operatively mounted on means carried by said spaced-apart end elements within said tubular support member, whereby said telemetric means is adapted to detect relative movement of said end elements caused by axial deformation of said support member produced by changes in the tensile loading of said tendon,

wherein both of said spaced end elements are apertured to accommodate the passage of the tendon through the cell, whereby the load cell may be positioned on the tendon between one of the stop members and the structure being compressed and tension on the tendon will place said support member under corresponding compression.

3,934,466

RESISTANCE SENSING FREE-POINT TOOL

Willie A. Curry, Houma, La., assignor to Jude Thaddeus Fanguy, Houma, La., a part interest

Filed May 16, 1974, Ser. No. 470,558
Int. Cl.² E21B 47/024
U.S. Cl. 73—151 **1 Claim**

1. A free-point indicator system for determining the elevations of stuck and free portions of a pipe in a borehole, comprising:

a. a free-point indicator tool including

i. an upper section and a lower section mounted for longitudinal movement relative to each other,

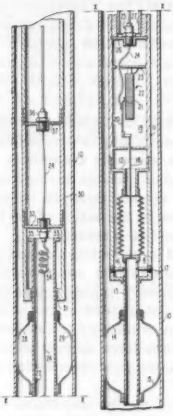
ii. frictional means on each of said sections for frictionally engaging the inside of a pipe to thereby cause said upper section to move upwardly relative to said lower section upon a stretching of the pipe,

iii. a variable resistance having a winding and a wiper arm, one of said winding or wiper arm being mechanically attached to said upper section for movement therewith and the other of said wiper arm or winding being mechanically attached to said lower section and fixed thereto, and

iv. slack joint means slidably connected to said upper section for limited relative movement therebetween, said slack joint means having fully open and fully closed positions and intermediate positions, said free-point indicator system being capable of being raised when said slack joint is in its fully open position or of being lowered when said slack joint is in its fully closed position but remaining stationary when said slack joint is in an intermediate position,

b. a single conductor wire line electrically connected to said wiper arm and extending to the surface, and

c. surface sensing means connected to said single conductor wire line for measuring the relative change in resistance due to the relative movement of said winding with respect



to said wiper arm, said surface measuring means including,

i. an indicating meter,

ii. a D. C. power supply, said indicating meter and said D. C. power supply being connected with said single conductor wire line to a common node and electrically referenced to ground and

iii. balancing and calibrating means connected to said single conductor wire, said indicating meter and said D. C. power supply for balancing out the resistance of said single conductor wire and adjusting the free-point zero and range of said indicating meter, said balancing and calibrating means including a first variable resistance connected in series between said single conductor wire line and said common node, a second variable resistance connected in shunt with said indicating meter, and a third variable resistance connected in series between said D. C. power supply and said common node, said first variable resistance serving to balance out the resistance of said single wire line, said second variable resistance serving to adjust the range of said indicating meter, and said third variable resistance serving to adjust the sensitivity of said surface measuring means.

3,934,467

SPINNER FLOWMETER WITH ISOLATED BEARINGS

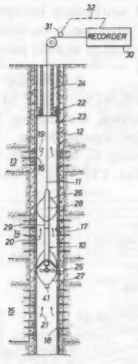
Yves Nicolas, Versailles, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 485,058

Claims priority, application France, Apr. 9, 1974, 74.12371

Int. Cl.[2] E21B *47/10*

U.S. Cl. 73—155 **35 Claims**



29. A well tool adapted for providing measurements representative of the flow rate of fluids in a well bore and comprising:

a body adapted for suspension in a well bore and including a depending axial spindle member having an unsupported outboard end portion;

fluid-driven impeller means including a hollow shaft member having a closed outboard end coaxially disposed around said spindle member for defining an inner lubricant chamber between said members above said closed shaft end, a plurality of impeller blades symmetrically arranged around said shaft member and having their respective inboard ends operatively coupled thereto for pivotal movement between laterally extended operating positions and generally longitudinal retracted positions, bearing means cooperatively mounted around said spindle member in said inner lubricant chamber for operatively journalling said shaft member for rotation about said spindle member upon relative movement of well bore fluids past said impeller means;

blade-positioning means including an actuating member coupled to said impeller blades and cooperatively arranged on said body for selective movement between one position operable for placing said impeller blades in their said operating positions and another position operable for placing said impeller blades in their said retracted positions;

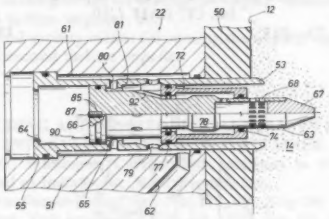
means on said body defining an outer lubricant chamber in communication with the exterior of said body; and

passage means cooperatively arranged on said body for intercommunicating said inner and outer lubricant chambers and including at least one multi-directional portion adapted for at least retarding the movement of solid matter through said passage means into said inner lubricant chamber.

3,934,468
FORMATION-TESTING APPARATUS

Emmet F. Brieger, Nogal, N. Mex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,085
Int. Cl.[2] E21B 47/10
U.S. Cl. 73—155 18 Claims



1. Apparatus adapted for testing earth formations of different degrees of competency and comprising:

a body adapted for suspension in a well bore penetrating such formations;

sample-collecting means cooperatively arranged on said body for receiving samples of connate fluids produced from such formations;

sealing means having a central opening therein cooperatively arranged on said body and adapted for sealing engagement with a well bore wall to isolate a portion thereof adjacent to said central opening from well bore fluids;

a tubular probe having a closed forward portion and cooperatively arranged for movement relative to said body from a normal retracted position to an extended position where said closed forward portion of said tubular probe is projected through said central opening and is ahead of said sealing means;

filtering means cooperatively arranged on an intermediate portion of said tubular probe and adapted for admitting connate fluids into the interior of said tubular probe and restraining loose formation materials from passing into the interior of said tubular probe whenever said tubular probe is in its said extended position;

first passage means adapted for providing communication between said sample-collecting means and said central opening;

second passage means adapted for providing communication between said sample-collecting means and the interior of said tubular probe;

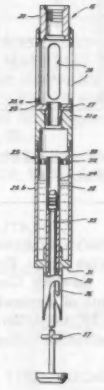
probe-actuating means cooperatively arranged on said tubular probe and adapted for advancing said tubular probe toward its said extended position as loose formation materials are eroded away from an isolated wall portion of a well bore wall ahead of said closed forward portion of said tubular probe and enter said first passage means; and

valve means cooperatively arranged for normally blocking communication through said second passage means and operable in response to movement of said tubular probe toward its said extended position for successively blocking further communication through said first passage means and opening communication through said second passage means.

3,934,469
METHOD AND STEAM SAMPLERS

Curtis E. Howard, Humble, and Douglas G. Calvin, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,073
Int. Cl.[2] E21B 47/00
U.S. Cl. 73—155 19 Claims



1. A method for collecting a sample of steam at a desired location down in a well comprising the steps of,

a. passing the steam that has arrived at the desired location through a tube means internally of a cylindrical collecting vessel,

b. passing a portion of the steam vapor phase and liquid phase from the tube means through an upper opening in the tube means out into an annulus formed between the tube means, and the cylindrical collecting vessel,

c. passing the steam vapor phase back into the tube means through side openings therein and out an opening in the lower end of the tube means,

d. collecting the steam liquid phase in the annulus, and

e. sealing the annulus with a sample of steam liquid phase therein for recovery at the surface.

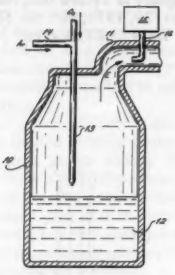
3,934,470
METHOD FOR MEASURING THE FLOW RATE OF THE GASES COMING OUT OF AN OXYGEN CONVERTER

Giovanni Amati, Via Cavalleggeri d'Aosta 11, and Bruno Costa, Via Petrarca 31, both of Naples, Italy

Filed Nov. 23, 1973, Ser. No. 418,518
Claims priority, application Italy, Nov. 30, 1972, 13049/72
Int. Cl.[2] G01F 1/70
U.S. Cl. 73—194 R 2 Claims

1. In a process for measuring the flow rate of a gas formed in an oxygen conversion process which conversion process is carried out by introducing oxygen into an oxygen converter containing a material to be oxidized and gaseous effluent, including a gas formed in said oxygen converter, are withdrawn, the improvement which comprises including in the oxygen feed to said converter between 0.15 and 1% by volume argon, as a tracer, and determining the concentration of said

argon in the gaseous effluent at the mouth of the converter or at a point before which the effluent gases are mixed with air

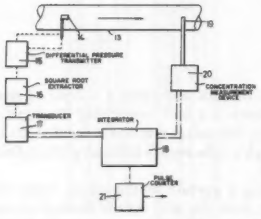


or pollutant or before which the effluent gases are subjected to a combustion reaction.

3,934,471
FLOW MONITORING SYSTEM

Percy William White, Oak Lodge, Great Tey, Essex, and Frank William Batley, 3 Bowling Green, Great Waldingfield, Sudbury, Suffolk, both of England

Filed Jan. 29, 1974, Ser. No. 437,588
Claims priority, application United Kingdom, Feb. 7, 1973, 5983/73
Int. Cl.² G01F 1/74
U.S. Cl. 73—194 E **6 Claims**



1. A mechanism for monitoring the rate at which material dispersed in a fluid stream passes through a given region, and for giving an output signal proportional to that rate, which mechanism comprises:

a. fluid flowrate measurement means for measuring the rate of flow of the fluid through the said given region, and for providing an electrical output proportional thereto;

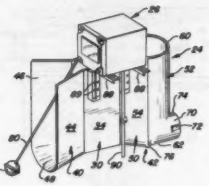
b. material concentration measurement means for measuring the concentration of the material in the fluid stream passing through the said given region, and for providing an electrical output proportional thereto; and, operatively connected to the said fluid flowrate measurement means and the said material concentration measurement means

c. an integrative device for multiplying together the outputs from the said fluid flowrate measurement means and the said material concentration measurement means, and then summing the multiplied outputs, the integrative device incorporating a multiplying element for operating on the said electrical outputs from the said fluid flowrate measurement means and the said material concentration measurement means and producing a voltage output proportional to the product thereof; the multiplying element producing an output voltage Z at any instant related to its two input voltages X and Y such that $Z = KXY$, where K is a constant, there being two buffer amplifiers, one of the said two buffer amplifiers operating on each of the said two inputs, a voltage-to-frequency converter for converting said product to a pulsed constant amplitude signal, the frequency of the pulses thus being proportional to the rate of passage of the said material, and a counting device for summing the pulses supplied thereto from the voltage-to-frequency converter.

3,934,472
FLUME-TYPE METERING

Allen C. Bradham, Milwaukee, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed July 15, 1974, Ser. No. 488,307
Int. Cl.² G01F 1/20
U.S. Cl. 73—215 **18 Claims**

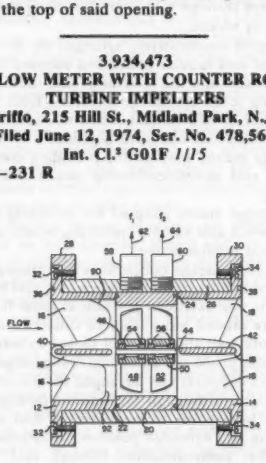


11. In combination with a reservoir and at least one restricted conduit communicating at one end with said reservoir, a flume unit for use in measuring liquid flow through said conduit to or from said reservoir, said flume unit comprising a throat section including bottom and side walls defining a venturi throat passage, a well section extending from one end of said throat section and including bottom, side and end walls defining a closed-end well in open communication with one end of said throat passage, said well section being formed with an opening through the lower portion of said section, means forming a closed conduit connection between said opening and said one end of said conduit for liquid passage communication between said well and said conduit, and said side and end walls of said throat section and said well section being of a height substantially greater than and extending above the level of the top of said opening, said walls thereby precluding flow of liquid through said unit to or from said conduit, except through said opening and through the end of said throat passage opposite said well section, up to a liquid level substantially above the top of said opening.

3,934,473
FLUID FLOW METER WITH COUNTER ROTATING TURBINE IMPELLERS

Joseph B. Griffo, 215 Hill St., Midland Park, N.J. 07432

Filed June 12, 1974, Ser. No. 478,567
Int. Cl.² G01F 1/15
U.S. Cl. 73—231 R **16 Claims**



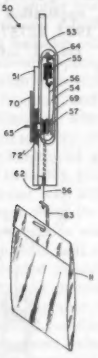
1. A meter for measuring fluid flow comprising:

a. A fluid conduit;
b. shaft support means mounted within said conduit;
c. a shaft axially mounted on said shaft support means;
d. a first turbine impeller having a plurality of blades rotatably mounted in said conduit on said shaft;
e. a second turbine impeller having a plurality of blades rotatably mounted in said conduit on said shaft, said second turbine impeller mounted proximate and downstream from said first turbine impeller, said second turbine impeller free to respond to any fluidynamic aberration developed from said first turbine impeller, said second turbine impeller arranged to rotate in a direction opposite that of said first turbine impeller;
f. first sensing means for sensing the angular velocity of said first turbine impeller; and
g. second sensing means for sensing the angular velocity of said second turbine impeller.

3,934,474
HOLDING AND MONITORING APPARATUS FOR INTRAVENOUS INFUSION CONTAINER

Robert G. Whitinger, Carmel, Ind., assignor to Methodist Hospital of Indiana Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 270,336, July 10, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 409,798
Int. Cl.² G01F *23/20*
U.S. Cl. 73—296 **1 Claim**

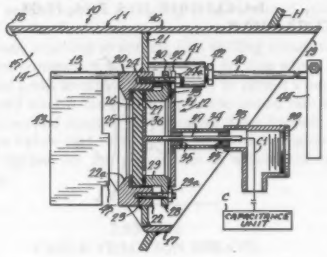


1. An apparatus for holding an intravenous infusion container and for allowing measurement of relative amounts of liquid within the container over a period of time comprising:
a base;
a markable sheet mounted to said base and having a first marking and a second marking provided thereon;
an axle extending through said sheet being rotatably mounted on said base and rotatable about an axis through an angle to and from said first marking and said second marking;
a pointer removably mounted to said axle adjacent said sheet, said pointer movable through an arc about said axis, said pointer being positioned at one end of said arc when said axle is positioned at an end of said angle corresponding to said first marking with said pointer positioned at the other end of said arc when said axle is positioned at an end of said angle corresponding to said second marking, said pointer having a vertically stationary axis of rotation;
a line connectable to said container for suspendedly holding said container, said line being wrappingly received on said axle;
a helical spring having one end connected to said base and an opposite end connected to said line being yieldable under the weight of said container when full to allow said axle to rotate through said angle to said first marking and to urge said axle to rotate back through said angle to said second marking as said container is emptied;
a spool rotatably mounted by said axle in said base, said line having one end connected to said spring and an opposite end connected to a hook upon which said container is removably mounted, said line being wrapped around said spool;
said spool includes a wall and a pair of drums spaced apart by said wall, said line is wrapped around one of said drums and then extends through said wall and is then wrapped around the other of said drums.

3,934,475
CAPACITANCE TYPE MATERIAL LEVEL DETECTOR FOR HOPPERS

Earl Edward Rodgers, Des Plaines, and Gerald Allen Mellinger, Libertyville, both of Ill., assignors to United Conveyor Corporation, Deerfield, Ill.

Filed Aug. 9, 1974, Ser. No. 496,134
Int. Cl.² G01F *23/26*; H01G *5/20*; H01H *35/18*
U.S. Cl. 73—304 C **10 Claims**



9. Material level detector means for a hopper comprising, in combination:
a detector unit including an electrically conductive sensor member which is adapted to be electrically connected to a capacitance unit;
support means mounting said detector unit in an opening in a hopper sidewall, said support means sealing the periphery of said opening and being sealed to the detector unit;
and manually manipulable detector checking and cleaning means comprising a paddle which hangs alongside the detector unit on a rod that is carried in the support means, said paddle being positioned and arranged to be swung into the area in front of the detector unit by rotation of the rod and to break accumulated material from the face of said unit by sliding the rod rearwardly.

3,934,476
LINEAR TELETHERMOMETER

Harry H. Lamb, II, No. 3 Richards Drive, Dartmouth, Canada

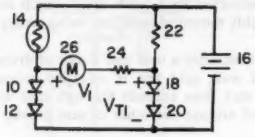
Filed Sept. 11, 1969, Ser. No. 857,102. The portion of the term of this patent subsequent to Jan. 27, 1990, has been disclaimed.
Int. Cl.² G01K *7/24*
U.S. Cl. 73—362 AR **6 Claims**

1. A nearly linear telethermometer device comprising a remote thermistor connected in series with one or more semiconductor diodes of any composition with a voltage-current relationship given by

$$i = I_\sigma(e^{v/n\lambda_\sigma} - 1)$$

where n is the number of diodes and being either discrete or integrated circuit devices,
means for electrically connecting a biasing potential to said thermistor and diode(s) such that the diodes are forward biased,

means for electrically connecting across said diode(s) device for measuring the voltage produced across said diode(s) which varies according to changes in the temperature of said thermistor.

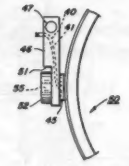


3,934,477

TEMPERATURE SENSING DEVICE

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 388,676, Aug. 15, 1973, Pat. No. 3,888,622. This application Nov. 13, 1974, Ser. No. 523,615
Int. Cl.² G01K *1/16, 7/16, 13/08*
U.S. Cl. 73—362.8 5 Claims



1. Apparatus for sensing the surface temperature of a heated body including

a temperature sensing element mounted within a probe,

means to support the probe adjacent to the heated body in non-contiguous relation therewith so as to form an air gap therebetween,

magnetic means for establishing a flux field within the air gap between the probe and the heated body, and

a magnetic medium filling the air gap and having a relatively high coefficient of thermal conductivity and being supported within the magnetic flux field to effect low frictional characteristics while providing rapid thermal response.

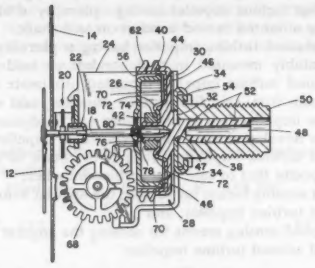
3,934,478

MAGNET SHAFT ASSEMBLY FOR SPEEDOMETER AND ODOMETER

Patrick L. Powell, Franklin Park, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Nov. 28, 1973, Ser. No. 419,519
Int. Cl.² G01P *3/49*
U.S. Cl. 73—519 12 Claims

1. An improved magnet shaft assembly for use in rotating a speedometer speed cup having a rim wall, comprising a metal flux collector having an axially extending portion spaced radially outwardly of said speed cup rim wall, a bar magnet spaced radially inwardly of said rim wall, and a molded plastic magnet shaft having an integrally formed portion adjacent one end in molded engagement with said flux collector including the axially extending portion and bar magnet for securing said magnet and collector to said magnet shaft.

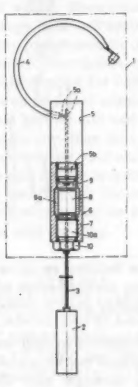


3,934,479

MEASUREMENT APPARATUS INFLUENCED BY DISTURBING AMBIENT TEMPERATURE FLUCTUATIONS

Mario Posnansky, Horgen, Switzerland, assignor to Haenni & Cie Aktiengesellschaft, Jegenstorf, Switzerland

Filed Dec. 3, 1973, Ser. No. 421,272
Claims priority, application Switzerland, Dec. 6, 1972, 17732/72; Nov. 9, 1973, 15757/73
Int. Cl.² G01K *5/36*
U.S. Cl. 73—368.6 15 Claims

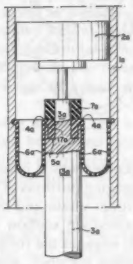


1. A measurement apparatus influenced by disturbing ambient temperature fluctuations, said measurement apparatus comprising a limited volume which is filled with a medium subjected to said temperature fluctuations and having a coefficient of thermal expansion, a compensation element which, under the influence of said disturbing temperature fluctuations, alters the size of a compartment forming a part of said limited volume containing the medium and thus alters said limited volume, the dimensions and coefficient of thermal expansion of said compensation element being selected such that, taking into account the coefficient of thermal expansion and the quantity of filling medium contained in said compartment, the increase and decrease in total volume of the limited volume is substantially the same as the expansion and contraction respectively of the filling medium caused by the influence of the disturbing temperature fluctuations upon the apparatus.

3,934,480
ROLLING DIAPHRAGM SEAL BETWEEN TWO RELATIVELY MOVING PARTS

Anton Marie Nederlof, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 11, 1973, Ser. No. 378,246
Claims priority, application Netherlands, July 21, 1972, 7210087
Int. Cl.² F16J 15/50
U.S. Cl. 74—18.2 6 Claims



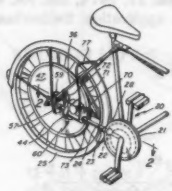
1. In an apparatus including a cylinder element, a piston element reciprocally movable in the cylinder, a rod extending axially from the piston with an annular space defined between said rod and cylinder element, and a rolling diaphragm seal and means for securing same between said rod and cylinder element for separating said annular space into two portions, the improvement in combination therewith wherein, said rod comprises a first part of first diameter, and an axially adjacent second part of second larger diameter, with a shoulder defined at the transitional area between said first and second parts and an annular groove extending lengthwise generally axially inward from the surface of said shoulder, said seal being a tubular member formed by a tubular wall with first and second ends, and having wall thickness along its length and greater thickness at the first end, said groove width being approximately the same as the thickness of said seal's first end, said first end being removably located in said groove and said second end being secured to said cylinder, said apparatus further comprising an annular member of elastic material movable between first and second positions on said rod, the first position of said annular member being spaced from said shoulder and thus defining therebetween a gap of smaller length than the thickness of said first end of the seal for locking said first end in said groove, said second position of the member being spaced axially farther from the first position and from said first end of the seal to permit removal of said first end from the groove.

3,934,481
AUTOMATIC FRICTION DRIVE TRANSMISSION

Donald A. Foster, 78 Winthrop Road, Brookline, Mass. 02146

Filed Jan. 3, 1975, Ser. No. 538,347
Int. Cl.² F16H 15/04, 15/10
U.S. Cl. 74—190.5 18 Claims

1. A transmission for a vehicle of the type having a wheel to which power is to be applied to rotate it and a drive to provide wheel-turning power, said transmission including a friction member coaxially mounted with respect to said wheel to rotate therewith, a drive shaft disposed close to and radially with respect to the friction member and connected to said drive, a unit slidably mounted on said shaft with said shaft rotatable independently thereof, a friction wheel, means connecting said friction wheel to said shaft to slide therealong and to rotate therewith when the shaft is rotated in a direction to advance the vehicle, said friction wheel and said unit connected to move together along said shaft, the periphery of the friction wheel in engagement with said friction member, the ratio of revolution between the shaft and the friction member dependent on the radial position of the friction wheel relative to the friction member, said unit including means operable to shift said friction wheel and said unit along said shaft and having first and second connections with said friction wheel, the first operable to cause said shifting means to move said friction wheel and said unit in a direction to increase said ratio and the second operable to cause said shifting means to move said friction wheel and said unit in the opposite direction to decrease said ratio, said unit also including a control to actuate said shifting means to maintain the rotation of the shaft

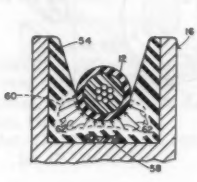


substantially constant at a predetermined rate, said control including first means responsive to the speed of the friction wheel and second means providing predetermined yieldable opposition to the first control means, said first and second control means coacting to actuate said shifting means to render said first connection operative if the friction wheel speed is above said predetermined rate thereby to permit a decrease in shaft speed until it reaches said predetermined rate and to render said second connection operative if the friction wheel speed drops below said rate thereby to permit a higher shaft speed appropriate for the slower rate at which said vehicle wheel turns.

3,934,482
CABLE TRACTION SHEAVE

Jimmy F. Byers, Georgetown, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1975, Ser. No. 544,167
Int. Cl.² F16H 55/48
U.S. Cl. 74—230.7 5 Claims



1. A cable traction sheave of the character described, said sheave comprising:

a circular sheave body formed of rigid material and having a peripheral groove defined therein of larger cross-sectional area than the cable to be accommodated;

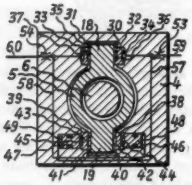
a groove liner comprising a solid elastomeric material bonded in said peripheral groove, said liner having a U-shaped cable receiving groove defined therein;

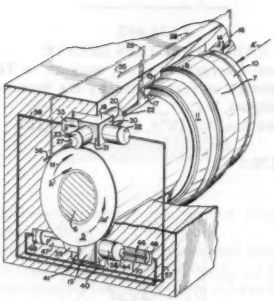
said liner comprising means, responsive to forces exerted on the bottom portion of said liner by a cable in said cable receiving groove, for causing said liner to increase lateral pressures on said cable;

said means for causing said liner to increase lateral pressures on said cable comprising a plurality of spring elements embedded in said solid elastomeric material, each of said spring elements comprising an outwardly bowed bight portion, disposed in the bottom portion of said liner,

and a pair of radially extending leg portions disposed in the side walls of said liner, whereby flattening of said bight portion causes said leg portions to urge said side walls of said liner toward one another and into gripping relation with a cable in said cable receiving groove.

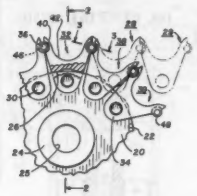
3,934,483
FEED APPARATUS
Walter Lüthi, Ebnat, Switzerland, assignor to Werkzeugmaschinenfabrik Oberlikon-Buhrle AG, Zurich, Switzerland
Filed Feb. 11, 1974, Ser. No. 441,653
Claims priority, application Switzerland, Feb. 23, 1973, 2646/73
Int. Cl.² F16H *1/18*
U.S. Cl. 74—424.8 R **9 Claims**





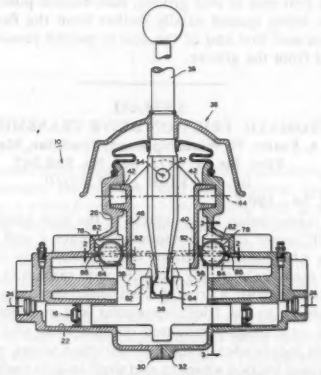
1. A feed apparatus for displacing a movable component with respect to a stationary component by means of a threaded spindle mounted at one component and a nut member arranged at the other component, the improvement comprising two ring members substantially concentrically arranged with respect to the axis of the spindle, the nut member being supported in the other component by means of said two ring members, two surfaces arranged perpendicular to the axis of the spindle, each of said ring members being radially displaceably supported at a respective one of the surfaces and extending into a respective substantially ring-shaped groove, means for hydraulically retaining said ring members in axial direction, and wherein between the grooves and the ring members there is provided sufficient play for positioning each ring member at an inclination in the groove, and said surfaces are directed opposite to one another.

3,934,484
TOOTH TRANSMISSION MEMBER UTILIZING PIVOTALLY INTERCONNECTED PREFORMS
Ben Bravin, 1365 Midvale Ave., Los Angeles, Calif. 90024
Filed Jan. 17, 1975, Ser. No. 541,725
Int. Cl.² F16H *55/12, 55/06, 55/30*
U.S. Cl. 74—446 **9 Claims**



1. A transmission member which is sequentially assembled to provide the tooth engaging portions of a power transmission sprocket for use with roller chain and the like, said sprocket having a profiled intermediate section which in a mounted condition cooperatively engages the roller and like portions of a roller chain transmission member, said member including: (a) a support member having a prepared support means of selected configuration; (b) a preform having a midportion containing a positive power transmission profile formed in its outwardly facing portion, said profile providing a roller receiving contour, the preform having means for precisely engaging the support member; (c) retaining means provided on said preforms to cooperatively engage the support member and maintain this preform in a fixed condition on said member, and (d) hinge means formed in each of the two upwardly extending portions of the preform, said hinge means cooperatively secured to the next preform by a hinge retaining member, the hinge when connected forming a pivotal connection by which the preform is retained in a spaced relationship to the next adjacent preform.

3,934,485
RESISTANCE-PRODUCING STRUCTURE FOR A TRANSMISSION SHIFTING MECHANISM
Richard L. Ratliff, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed June 17, 1974, Ser. No. 479,962
Int. Cl.² G05G *9/02, 9/12*
U.S. Cl. 74—473 R **12 Claims**



1. In a shifting mechanism for a mechanical transmission of the type including a support housing, a plurality of longitudinally shiftable members therewithin, a gear shift lever unit

having a central position, a gimbal mounted within said support housing for transverse rocking or pivoting movement on a longitudinal axis but fixed against longitudinal movement, and a shift lever carried by said gimbal for transverse movement therewith and pivoted therein and relative thereto for longitudinal fore-and-aft shifting movement about a transverse axis, said shift lever having a downwardly projecting shift element for selectively engaging and longitudinally shifting each of said longitudinally shiftable members, the improvement comprising:

a. said support housing including at least one pair of longitudinally-extending as well as spaced upper and lower boss portions located below and laterally and oppositely spaced from the longitudinal pivot axis of said gimbal;

b. pre-loaded yieldable means interposed between said at least one pair of spaced upper and lower boss portions; and

c. said gimbal having at least one longitudinally extending projection located below and laterally spaced from said gimbal longitudinal pivot axis, said projection entering between said spaced upper and lower boss portions to abut and further load said yieldable means, and thereby provide operator feel, upon the pivoting movement of said gimbal from said shift lever central position to a direction bringing said projection laterally toward said gimbal longitudinal pivot axis.

3,934,486
SAFETY STEERING COLUMN

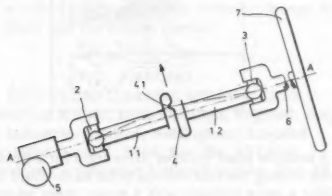
Burkhardt Becker; Heinz Wallach, both of Wolfsburg, and Rainer Heise, Wolfsburg-Neuhaus, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 5, 1974, Ser. No. 486,074

Claims priority, application Germany, July 19, 1973, 2336788

Int. Cl.² G05G *1/08*; F16D *3/56*

U.S. Cl. 74—492 **6 Claims**



1. A safety steering column for a vehicle having a steering wheel assembly and a steering gear assembly comprising a rotatable composite shaft extending between the steering wheel assembly and the steering gear assembly, the composite shaft being divided intermediate its ends into two shaft parts, a first relatively torsion-stiff joint coupling adjacent ends of the two shaft parts, and second and third relatively torsion-stiff joints coupling opposite ends of the composite shaft to the steering wheel assembly and the steering gear assembly, respectively, wherein at least the first joint includes an S-shaped metal member having three generally linear portions connected in series by two curved portions, an indentation being formed in a central one of the three linear portions of the metal member at a position radially offset from the central longitudinal axes of the shaft parts, the indentation being adapted to function as a first pivot point, the two shaft parts being coupled to different ones of the two outer linear portions of the S-Shaped metal member of the first joint.

3,934,487
VEHICLE STEERING COLUMN

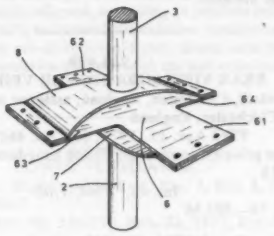
Burkhardt Becker, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 5, 1974, Ser. No. 486,075

Claims priority, application Germany, July 20, 1973, 2336968

Int. Cl.² G05G *1/08*; F16D *3/56*

U.S. Cl. 74—492 **1 Claim**



1. A steering column for a vehicle having a steering wheel and a steering gear comprising a first rotatable stub shaft coupled to the steering wheel, a second rotatable stub shaft coupled to the steering gear, a rotatable steering shaft extending between the first and second stub shafts, a first coupling means for coupling one end of the steering shaft to the first stub shaft, and a second coupling means for coupling the other end of the steering shaft to the second stub shaft, at least one of the coupling means coupling the steering shaft to one of the stub shafts so as to define an angle between the steering shaft and said one of the stub shafts, said at least one coupling means being relatively torsion-stiff and fabricated of metal plate and including a metal stamping having four arms disposed in a cross-like configuration, a first metal strip rigidly coupled intermediate its ends to an end of the steering shaft and at its ends to two opposed arms of the stamping, and a second metal strip rigidly coupled at its ends to two different opposed arms of the stamping and intermediate its ends to an end of said one of the stub shafts, the first strip being located on one side of the stamping and the second strip being located on the other side of the stamping.

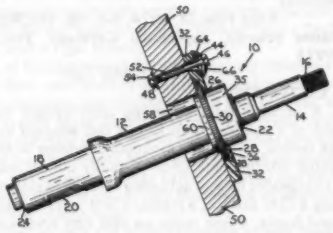
3,934,488
STEERING CONTROL HEAD WITH ADJUSTABLE POSITIONING MEANS

George Cantley, Akron, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 21, 1975, Ser. No. 560,579

Int. Cl.² B62D *1/18*

U.S. Cl. 74—493 **14 Claims**



1. A steering control head with adjustable positioning means comprising a housing, a shaft rotatably supported in said housing, said shaft operatively attached to a steering

system, said housing having thereon a radially extending shoulder, said shoulder having, at least on a part of its outer surface, a series of teeth, a collar having an opening therethrough for fitting over and around said housing, said collar having an annular counterbore surrounding said opening to accept said shoulder therein, the inner axially extending surface of said collar counterbore having, at least on a part thereof, a series of teeth for meshing with said teeth on said shoulder, said collar being provided with a fastening means to fasten said collar and said housing intermeshed therewith to a bulkhead member.

3,934,489

REAR VIEW MIRRORS FOR VEHICLES

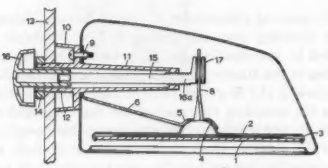
John Bottrill, Chichester, England, assignor to Wingard Limited, Chichester, England

Filed Apr. 11, 1974, Ser. No. 460,102

Claims priority, application United Kingdom, Apr. 12, 1973, 17545/73

Int. Cl.² F16C *1/00*

U.S. Cl. 74—501 M **4 Claims**



1. An exterior rear view mirror for vehicles in which a mirror located within a stationary housing is adjustable by remote control wherein said mirror is floatingly mounted in a housing and exposed in an opening in one end of the housing and is resiliently urged against an internal abutment flange in the housing set in from and parallel to the opening, and the rear face of the mirror is engaged by a radial finger carried by a rotatable spindle passing through and in screw-threaded engagement with a central boss in the housing at the end remote from the opening whereby the spindle on being rotated moves axially towards the mirror glass and the finger effects a rotating displacement of the edge of the mirror away from said abutment flange through a progressively increasing angle.

3,934,490

SPRING ASSISTED VARIABLE RATIO BRAKE OPERATING LEVER SYSTEM

Hans O. Schroter, 18 Robert-Koch-Strasse, 8 Munich 22, Germany

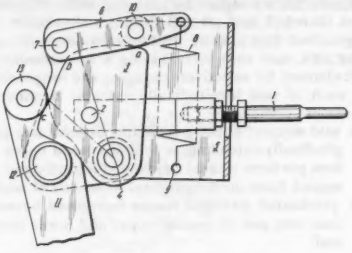
Filed Feb. 28, 1974, Ser. No. 446,905

Claims priority, application Germany, Feb. 28, 1973, 2309973

Int. Cl.² G05G *1/04*

U.S. Cl. 74—520 **10 Claims**

1. A variable ratio operating lever system for the brake system of a vehicle comprising a rod adapted to actuate the brake system, a pivotally mounted actuating lever, a pivotally mounted intermediate lever pivotally connected to said rod and engageable by said actuating lever, said intermediate lever having a cam surface, a frame, a first lever pivotally mounted on said frame, a first roller on said first lever and means for resiliently urging said first roller against said cam surface, and said first roller being guided substantially concentrically to the pivot mount of said intermediate lever at least through half of the pivoting path of the intermediate lever in the braking direction and at a decreasing distance from said pivot mount upon further actuation in the braking direction so that the ratio between the distance travelled by the actuating lever



around its pivot and the travel of the rod initially increases and then decreases.

3,934,491

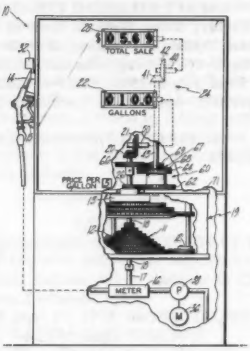
SETTABLE VARIATOR DRIVE MECHANISM

Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Aug. 29, 1974, Ser. No. 501,852

Int. Cl.² F16H *37/06*

U.S. Cl. 74—681 **15 Claims**



1. In a settable price variator drive train for a fluid delivery system for setting the unit volume price of the fluid delivered, comprising a price variator with a rotary input adapted to be rotated in accordance with the volume of fluid delivered, a rotary output, and gear means interconnecting the price variator input and output having settable price gear means settable for establishing the drive ratio between the variator input and output for establishing the unit volume price of the fluid, and a rotary drive mechanism for connecting the variator for registering the cost of fluid delivered in accordance with the volume of fluid delivered and the unit volume price established by the setting of the price gear means, the improvement wherein the rotary drive mechanism comprises a rotary drive output adapted to be connected for registering the cost of fluid delivered and first and second rotary inputs respectively connected for being driven by the variator output and by the variator input bypassing the settable price gear means, and selectively engageable intermediate drive control means controlled by said first rotary input for selectively connecting said second rotary input for rotating the rotary drive output in accordance with the rotation of said first rotary input whereby at least part of the torque load on the rotary drive output is transmitted thereto from the variator input via said second rotary input and bypassing the settable price gear means.

3,934,492

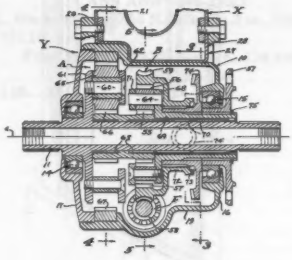
VARIABLE SPEED DRIVE FOR BICYCLES AND THE LIKE

Norman E. Timbs, 10421 Beckford Ave., Northridge, Calif. 91324

Continuation of Ser. No. 428,029, Dec. 26, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 558,673

Int. Cl.[2] F16H *37/06*

U.S. Cl. 74—740 11 Claims



1. A low velocity high torque infinitely variable speed constant mesh transmission for bicycles and the like, including; a case with a crank shaft extending therethrough and with its opposite ends projecting from the case, a first stage speed changer comprising, a stationary ring gear and an input planet gear journaled on a carrier driven by the crank shaft and in constant mesh with said ring gear, and an output sun gear in constant mesh with said planet gear to be driven at increased angular velocity thereby; and a second stage speed changer comprising, an input sun gear driven by the first stage sun gear and a planet gear journaled on an output carrier rotatable over the crank shaft and in constant mesh with said second stage sun gear, and a rotatable ring gear in constant mesh with said planet gear; and an infinitely variable speed feedback drive means driven by the output carrier of the second stage and controlling the angular velocity of the rotatable second stage ring gear to effect a commensurate velocity change between the crank shaft and the output carrier.

3,934,493

EPICYCLIC CHANGE SPEED GEARS

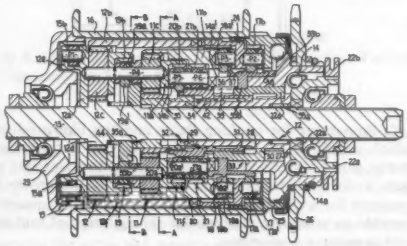
Anthony William Hillyer, Loughborough, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Dec. 12, 1974, Ser. No. 531,964

Claims priority, application United Kingdom, Dec. 15, 1973, 58416/73

Int. Cl.[2] F16H *3/44*, *57/10*

U.S. Cl. 74—750 B 14 Claims



1. An epicyclic change-speed gear hub for a bicycle, tricycle or the like comprises first and second epicyclic gear trains arranged for operation about a common axis, uni-directional clutch means between such gear trains adapted selectively drivingly to connect the same, first output uni-directional clutch means adapted drivingly selectively to connect the planet cages of the epicyclic gear trains with the hub shell, second output uni-directional clutch means adapted drivingly and selectively to connect the gear rings, of the epicyclic gear trains with the hub shell, input uni-directional clutch means selectively co-operable with the respective epicyclic gear trains, a driver drivingly connected with the input uni-directional clutch means and adapted to transmit a forward drive motion to the hub through such means, and a cam and cam follower mechanism adapted, according to position relative to the axis of the hub, to control the relative conditions of the input and output uni-directional clutch means selectively to give a drive transmission path through the hub consistent with requirements.

3,934,494

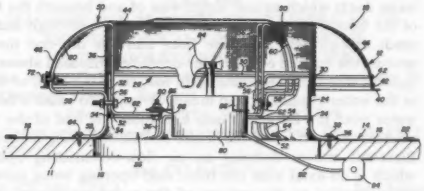
POWER VENTILATOR

Henry N. Butler, Highway 180 East, Rte. 3, Box 3, Mineral Wells, Tex. 76067

Division of Ser. No. 335,073, Feb. 23, 1973, Pat. No. 3,862,218. This application Mar. 22, 1974, Ser. No. 454,005

Int. Cl.[2] F24F *7/02*

U.S. Cl. 98—43 1 Claim



1. A ventilator for installation on horizontal and inclined surfaces of roofs having an opening connected with a space to be ventilated, comprising:

a hollow support base with the interior of said base, communicating with said opening, said support base having a first square-shaped flanged portion resting on the surface of said roof, a second cylindrical flanged portion extending transverse to the plane of said first flange, said first and second flanges being constructed from flexible material, a rigid frame reinforcing said first and second flange, a plurality of rigid feet extending from said frame, said rigid feet being attached to said roof;

a generally dome-shaped cover for said support base, said dome-shaped cover having arcuate portions adjacent the periphery thereof, said cover being formed from a flexible material and a rigid frame;

a plurality of bracket means for attaching said cover to said support base, said bracket means having an arcuate portion for contacting the arcuate portion of said cover, said bracket means being attached to the rigid frame of said cover and the rigid frame of said base, rigid feet extending from said bracket means, said rigid feet being attached to the roof, a fan support flange extending from one end of each of said bracket means into the interior of said cylindrical flange of said base;

a fan attached to said fan support flanges of said bracket means and the interior of said cylindrical flange causing air to flow from said base through said ventilator; and

screen means extending across the opening between said cover and said base for preventing undesirable objects from entering said ventilator.

3,934,495

PAINT SPRAYING BOOTHS

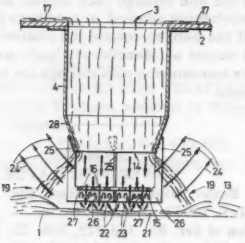
Ivan Bloomer, London, England, assignor to Carrier Drysys, Ltd., London, England

Filed Jan. 16, 1974, Ser. No. 433,778

Claims priority, application United Kingdom, Jan. 22, 1973, 3095/73; Mar. 5, 1973, 10650/73; July 24, 1973, 35239/73

Int. Cl.[2] F23J 11/00

U.S. Cl. 98—115 SB 8 Claims



1. In a paint-spraying booth of the type including a floor, apparatus for scrubbing paint-laden air, said apparatus comprising a water-container located beneath and spaced from the floor of the booth, air extraction means connected with exhaust ducts which extend lengthwise of and beneath the floor of the booth, at least one tube which opens through and extends downwardly from the floor and has the end thereof nearest the buttom of the water-container disposed above and spaced, when the apparatus is in use, from the level of water in the water-container, and means arranged to cause a flow of water over the floor and into said tube, the end of the tube nearest the bottom of the water-container having associated therewith means defining an air flow-constricting opening which is co-axial with the tube, said opening being substantially parallel to the bottom of the water container, and a baffle positioned between said air flow-constricting opening and the bottom of the water-container and spaced from each thereof in substantially parallel relationship with the air flow-constricting opening and the bottom of the water-container, said baffle being substantially co-axial with the air flow-constricting opening and having a plurality of perforations extending therethrough, said perforations being small as compared with said air flow-constricting opening, the arrangement being such that in use of the apparatus the baffle provides by impingement thereon a first stage separation of paint particles from entraining air, and water in the water-container immediately below the baffle providing by impingement thereon of paint entraining air which passes through the baffle perforations a second stage separation, and an annular curtain of flowing water formed between the end of the tube nearest the bottom of the water-container and the surface of water in the water-container providing a third stage separation by the lateral passage of paint entraining air therethrough.

3,934,496

COUNTERBALANCE MECHANISM FOR FUME HOODS

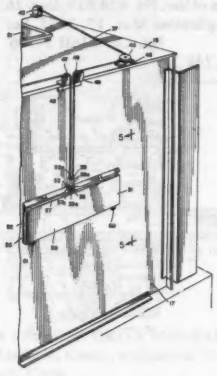
Michael Turko, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 23, 1974, Ser. No. 517,100

Int. Cl.[2] F23J 11/00

U.S. Cl. 98—115 LH 14 Claims

1. In a fume hood having a top, a back, and right and left sides forming a working chamber and a sash mounted for movement between raised and lowered positions for opening or closing the working chamber, an improved sash counterbalance apparatus comprising a single cable having a pair of ends, each end of the cable being attached to the sides of the sash to provide right and left portions of the cable, cable routing means on the top of the fume hood for routing the right and left portions of the cable over the top of the hood and down the back thereof, a counterbalance behind the back of the hood, and a clamp on the counterbalance clampingly securing



the right and left portions of the cable whereby if one of the right and left cable portions breaks the other cable portion remains attached to the counterbalance.

3,934,497

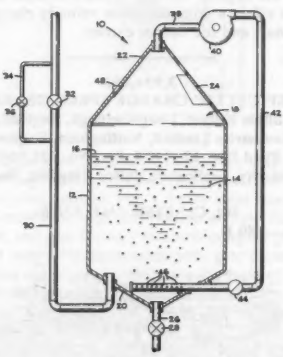
APPARATUS FOR COOKING FRUIT AND THE LIKE PRODUCTS

Phillip L. Hannah, San Jose, Calif., assignor to California Fruit Concentrates, Inc., San Jose, Calif.

Filed Apr. 17, 1974, Ser. No. 461,501

Int. Cl.[2] A47J 27/026, 27/04, 27/16

U.S. Cl. 99—476 6 Claims



1. Apparatus for cooking fruits and the like products in which said fruits are immersed in a body of water to form a slurry, said body of water being sufficient to cover said products to form said slurry and to create the necessary back pressure for an hydraulic head and of sufficient quantity to provide an adequate medium for the agitation of said slurry, said apparatus comprising:

a. a closed tank disposed for receiving said slurry in a lower portion thereof,

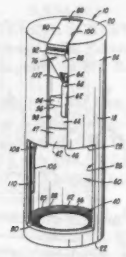
b. first means for introducing steam into the slurry contained in said tank for bringing said slurry approximately to a cooking temperature,

c. recirculating means for recirculating under pressure any moisture laden vapor which escapes from an upper surface of the slurry to a lower portion of said tank and into the slurry for heating said slurry and for agitating said slurry, said recirculating means being separate and apart from said first means.

3,934,498
COMPACTER FOR COMPACTING OBJECTS SUCH AS CANS AND THE LIKE

Donald L. Hochanadel, 9704 N. Georgia Ave., Oklahoma City, Okla. 73120

Filed Jan. 31, 1974, Ser. No. 438,448
Int. Cl.² B30B 7/04
U.S. Cl. 100—35 **16 Claims**



15. A method for compacting objects such as metal cans and the like between a pair of gripping members comprising the steps of:

spacing the gripping members a predetermined distance apart for receiving the object to be compacted therebetween;

placing the object between the two gripping members;

moving at least one of the gripping members toward the other gripping member into engagement with the object to be compacted;

holding the object to be compacted in a relatively stationary position with respect to each of the gripping members;

moving at least one of the gripping members toward the other gripping member thereby moving the gripping member toward a compacting position compacting the object between the two gripping members; and

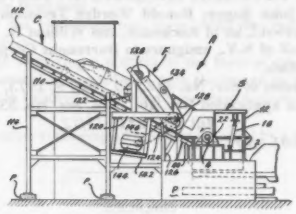
rotating at least one of the gripping members for twisting the object to be compacted as the gripping members are moved toward the compacting position, thereby rotating and weakening the structural integrity of the object to be compacted during the movement of the gripping members toward a compacting position.

3,934,499
SCRAP SHREDDING SYSTEM

Sven B. Strom, St. Louis, Mo., assignor to American Pulverizer Company, St. Louis, Mo.

Filed Mar. 21, 1974, Ser. No. 453,410
Int. Cl.² B30B 9/32
U.S. Cl. 100—53 **13 Claims**

1. A feeder for feeding large items of bulk scrap to a reducing machine which reduces the scrap to segments, said feeder comprising: a chute for receiving bulk scrap and having a bottom surface on which the scrap is supported; advancing means located above the supporting surface of the chute for engaging the scrap and moving it along the chute; at least one fluid operated cylinder for supporting the advancing means above the supporting surface of the chute; first and second pumps for supplying fluid to the hydraulic cylinder, the first pump being capable of elevating the pressure of the fluid sufficiently to overcome the weight of the advancing means, the second pump supplying fluid to the cylinder at a pressure less than that required to overcome the weight of the advancing means so that the advancing means will float on the scrap, exerting a force thereon less than; the force required to hold it away from the bottom surface of the chute whereby the feeder is supported by both the scrap and the cylinder; first

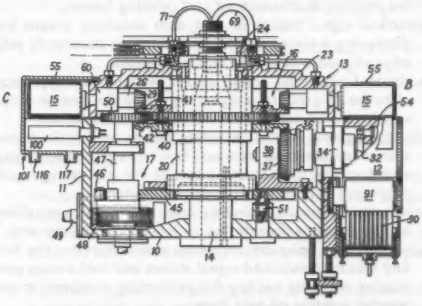


valve means between the first pump and the cylinder for directing high pressure fluid to the cylinder such that it will raise the advancing means; and second valve means between the second pump and the cylinder for directing pressure to the cylinder to exert a force on the advancing means in opposition to the weight of the advancing means.

3,934,500
MACHINE FOR PRINTING ON CYLINDRICAL OR FRUSTO-CONICAL CONTAINERS WITH ULTRA-VIOLET-LIGHT-SETTING INK

John Maxwell Jackson, Potters Bar, England, assignor to Chromax Limited, England

Filed Dec. 13, 1974, Ser. No. 532,399
Claims priority, application United Kingdom, Dec. 21, 1973, 59582/73
Int. Cl.² B41F 7/16
U.S. Cl. 101—38 A **14 Claims**



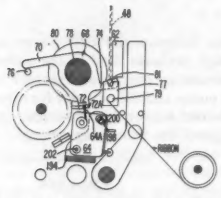
1. A multi-cylinder printing machine for printing on the surfaces of cylindrical or frusto-coincal containers in ultra-violet-light-setting inks, comprising a frame, a turret rotatably mounted on the frame, the turret having a plurality of rotatable mandrels for the containers to be printed, indexing means operable to turn the turret intermittently so as to index each mandrel in succession with printing stations around the turret, a plurality of printing cylinders rotatably mounted one at each of the printing stations, means for applying the ultra-violet-light-setting inks to the printing cylinders, and gear means for rotating the mandrels and printing cylinders in synchronism to ensure registration of the successive images printed by the printing cylinders on containers supported on the mandrels, wherein each mandrel is mounted in a recess in the turret with at least one side of the mandrel exposed to permit printing engagement between the printing cylinders and a container on the mandrel, and at least one ultra violet light source is arranged to direct light into the recesses to cure ink printed on

the containers, the light source being provided with a shroud co-operating with the turret to prevent escape of light except into a recess.

3,934,501
ALIGNMENT AND ACTUATING MECHANISM FOR MICR DOCUMENT ENCODING APPARATUS

Herbert John Bagen; Ronald Worden Ferguson; Henry M. Korytkowski, all of Rochester, and William H. Mowry, Jr., Ionia, all of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 412,780, Nov. 5, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,748
Int. Cl.² B41J *13/12*
U.S. Cl. 101—93 **5 Claims**



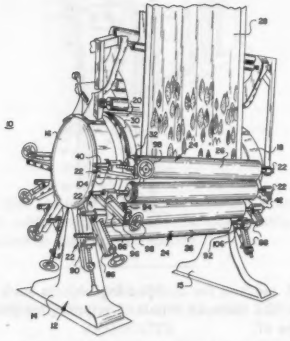
1. Control apparatus for printing devices comprising:
printing means for printing MICR encoding on an item such as a check,
demountable, removable item receiving means receivable in said printing means for positioning an item adjacent to the printing mechanism of said printing means,
electrical signal means in said item receiving means for producing a signal signifying the item is accurately side edge aligned within said receiving means,
additional electrical signal means within said apparatus effective to produce a signal signifying the item is properly bottomed relative to said printing mechanism,
electromagnetic means including means actuatable in response to the signals from said first and second mentioned signal means for actuating means for preventing cycle repetition and for printing upon said item,
said printing means including cam means for controlling and terminating the printing cycle of said apparatus and,
electrical time delay circuit means interconnecting the first and second mentioned signal means and said means preventing machine cycling for preventing a second or unwanted printing on said item.

3,934,502
ADJUSTABLE ROTARY SCREEN PRINTER WITH AIR-BIASED SQUEEGEES

Thomas J. Marino, Totowa, N.J., assignor to Morrison Machine Co., Paterson, N.J.

Continuation-in-part of Ser. No. 326,396, Jan. 24, 1973, abandoned. This application Dec. 31, 1974, Ser. No. 537,649
Int. Cl.² B41F *15/10, 15/42*
U.S. Cl. 101—115 **23 Claims**

1. A screen printing machine comprising:
a frame;
backing means supported by said frame to provide a support surface for material;
at least one rotary screen assembly carried by said frame in adjustably spaced relationship with respect to said support surface; said rotary screen assembly comprising:
an inner elongated support;
an outer hollow screen rotatably supported about said inner elongated support for rotation about an axis defined thereby;
elongated applicator means engaging the inner surface of said screen and supported by said elongated inner support;
and further including pressure adjusting means in the interior of said hollow screen, said pressure adjusting means comprising a plurality of axially spaced, individually inflatable elongated tubes positioned between said inner elongated support and said elongated applicator means for selectively urging said applicator means toward the inner periphery of said screen, whereby pressure applied to said applicator means may be selectively varied along the length thereof.



18. A screen printing machine comprising:
a frame;
backing means supported by said frame to provide a support surface for material;
at least one rotary screen assembly carried by said frame in adjustably spaced relationshp with respect to said support surface; said rotary screen assembly comprising;
an inner elongated support;
an outer hollow screen rotatably supported about said inner elongated support for rotation about an axis defined thereby;
elongated applicator means engaging the inner surface of said screen and supported by said elongated inner support;
and further including first adjusting means for rotating said inner elongated support about its said axis from a location outside of said hollow screen;
and further including second adjusting means for effecting axial motion of said inner elongated support; whereby the axial position of said screen with respect to said support surface is adjustably positioned;
further including first and second shaft members extending from opposite ends of said inner elongated support;
first and second holders carried by said frame for supporting said first and second shaft members;
wherein support surface means comprises a rotary drum mounted on a main shaft, and further comprising a sun gear mounted on said main shaft, said sun gear having helically oriented teeth circumferentially thereabout; and further including third adjusting means for effecting circumferential movement of said hollow screen with respect to said rotary drum; said third adjusting means comprising;
a gear rotatably and slidably supported on one of said first and second shaft members, said gear having helically oriented teeth which engage said helically oriented teeth of said sun gear;
connecting means interconnecting said gear and said hollow

screen for effecting simultaneous rotation of same while allowing free axial motion of said gear along said one shaft member;

selectively operable means for effecting axial motion of said gear to thereby effect circumferential movement of said screen with respect to said drum; and

wherein said one of said shaft members is hollow and additionally includes an elongated passageway therethrough located adjacent the portion of said one shaft member on which said gear is situated; said selectively operable means for effecting axial motion of said gear including an elongated shaft axially movable within said one shaft member, and pin means passing through said elongated passageway for connecting said elongated shaft to said gear.

3,934,503
STENCIL SCREENS

Layton C. Kinney, Chicago, and Edwin H. Tompkins, Riverside, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 648,861, June 26, 1967, abandoned, which is a continuation-in-part of Ser. No. 457,658, May 21, 1965, abandoned. This application Dec. 10, 1968, Ser. No. 782,666

Int. Cl.[2] B41W *1/24*

U.S. Cl. 101—128.2 **6 Claims**

1. A blank for forming a printing screen comprising in combination:

a flexible, porous substrate having a high tensile strength and having openings which extend between opposite faces and of a size to permit passage of ink therethrough;

a thin film on said substrate having high flexural and tensile strength, said thin film being uniform in cross section and including a combustible film former composed of an organic resin having a high percentage of hydrogen and carbon, a solid oxidizer uniformly dispersed throughout said film, and a fuel component, being resistant and impervious to said ink, said film being self-combustible, having a light-absorbing pigment in sufficient quantities per unit of surface area of said film to be ignitable and completely consumed in selected areas directly exposed to a high-intensity, short-duration pulse of light which raises the thin film to ignition threshold.

3,934,504
METHOD FOR PHOTO-MECHANICAL COMPOSITION OF DESIGNS ON STENCILS FOR FILM AND SCREEN PRINTING, PARTICULARLY ROTARY SCREEN PRINTING

Martin Klemm, Geriafingen, Switzerland, assignor to Fritz Buser AG., Maschinenfabrik, Wiler b. Utzenstrof, Switzerland

Continuation of Ser. No. 241,609, April 6, 1972. This application Apr. 4, 1974, Ser. No. 457,871

Claims priority, application Switzerland, Apr. 13, 1971, 5265/71; Aug. 3, 1971, 11432/71; June 21, 1971, 9055/71. The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.

Int. Cl.[2] B41N *1/24*; G03C *5/00*

U.S. Cl. 101—128.3 **6 Claims**

1. Method to make stencils having a stencil layer on printing grids having interstices between the grid lattice thereof, in which a photo-sensitive layer is utilized to be exposed in accordance with an image to be composed or printed, the non-exposed image portions being removed before printing, the method comprising

forming a level, smooth continuous composite surface of exposed grid lattice and a soluble filler located only in the interstices between the grid lattice, by

applying a filler material over a side of the printing grid, and penetrating the interstices between the lattice of the grid and

removing that portion of the filler material which extends over the printing grid to leave a smooth surface of grid lattice and intersticial filler material;

applying a continuous single photo-sensitive layer of sufficient thickness to form the stencil directly over the smooth surface of the exposed grid lattice and the filler in the interstices between the lattice with constant, controllable thickness,

exposing the photosensitive layer with the image to be composed;

selectively removing a portion of the layer of photo-sensitive material in accordance with the image to which the layer was exposed to develop the exposed photo-sensitive layer;

and thereafter removing all the filler material by a solvent.

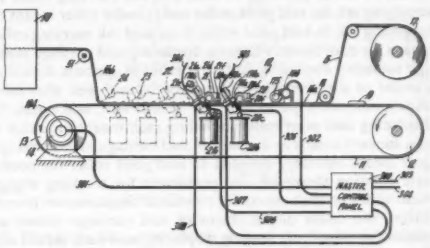
3,934,505
METHOD AND APPARATUS FOR SYNCHRONOUS PRINTING OF A MOVING WEB

David Kushner, New York, N.Y., assignor to Bernard Screen Printing Corporation, New Hyde Park, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,088

Int. Cl.[2] B41F *15/10*; B41M *1/12*; B41F *13/24*

U.S. Cl. 101—129 **7 Claims**



1. A method for synchronous printing on a moving fabric web comprising:

a. moving a fabric web on an endless belt across a first rotating cylindrical printing screen and then across a second rotating cylindrical printing screen;

b. transmitting a first electrical signal proportional to the speed of said web from said belt to a first signal comparator;

c. transmitting a second electrical signal proportional to the speed of said web from means moving said belt to said first signal comparator;

d. transmitting an electrical signal proportional to said first printing screen speed to said first signal comparator;

e. transmitting a corrective signal from said first signal comparator to control means for rotating said first printing screen;

f. transmitting said first electrical signal proportional to the speed of said web to a second signal comparator;

g. transmitting said second electrical signal proportional to the speed of said web to said second signal comparator;

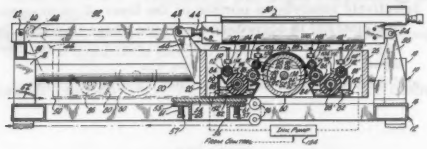
h. transmitting an electrical signal proportional to said second printing screen speed to said second signal comparator;

i. transmitting a corrective signal from said second signal comparator to control means for rotating said second printing screen; so that the speed of each of said printing screens is made equal to the web speed and in synchronization with the other.

3,934,506
APPARATUS FOR IMPRINTING INTERMITTENTLY ADVANCED WEBS

Murray N. Levy, Spring Valley, N.Y., and Vincent J. Gasparino, West Orange, N.J., assignors to Adolph Gottscho, Inc., Union, N.J.

Filed Apr. 2, 1974, Ser. No. 457,313
Int. Cl.² B41F 3/76, 3/14, 3/20
U.S. Cl. 101—260 14 Claims



1. A marking apparatus for imprinting webs advanced intermittently therepast comprising support means; back up plate means carried by said support means on one side of the path of said web; carriage means mounted on said support means for linear reciprocal displacement parallel to said web on the side thereof opposed to said back up plate means; marking means carried by said carriage means and including a print roller positioned for operative engagement of said web against said back up plate means during displacement of said carriage means to effect printing, at least one ink carrying roller for supplying ink for said print roller and transfer roller means for supplying ink to said print roller from said ink carrying roller; means for coordinately linearly displacing said carriage means and rotatably displacing said print roller in opposite directions parallel to the direction of advance of said web alternately during successive periods of rest of said web, said means for displacing said print roller including rack means mounted on said support means in the path of said carriage means and sput gear means operably coupled to said print roller for coordinate rotation therewith and positioned for meshing engagement with said rack means for rotational displacement thereby during the linear displacement of said carriage means and means for selectively linearly displacing said rack means relative to said support means for fine positioning said print roller relative to said backup plate; switch means positioned in the path of displacement of said carriage means in advance of each of the two respective rest positions thereof for actuation by said carriage means in advance of reaching said rest positions; and control means for decelerating and cushioning the stopping of said carriage means in advance of each of said rest positions in response to the actuation of said switch means.

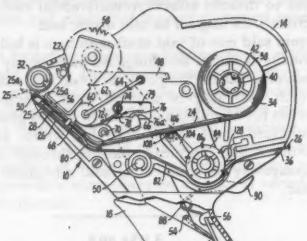
3,934,507
MERCHANDISE LABEL MARKING GUN

Don W. Geri, Mountain View, Calif., assignor to Primark Corporation, Dublin, Calif.

Filed Oct. 9, 1973, Ser. No. 404,486
Int. Cl.² B41F 1/08
U.S. Cl. 101—291 7 Claims

1. In an adhesive label printer having a printing head operably connected to an operating trigger, a casing, a drive assembly contained within the casing and adapted to incrementally transport a label tape having precut adhesive labels carried on a separable backing tape, and a printing plate on which individual labels are sequentially printed by said printing head and incrementally advanced by said drive assembly in a direction across said printing plate, said printing plate having a cooperating label separating means for sharply reversing the direction of the backing tape for separating printed labels from the backing tape, each label having a lead edge that is first separated from the backing tape at the label separating means, an improvement comprising:

pressure means adapted to engage said tape upstream from said label separating means and bias means urging said pressure means against the tape at each incremental advance and releasing after each separation, said bias means cooperatively engaged to said trigger, whereby the

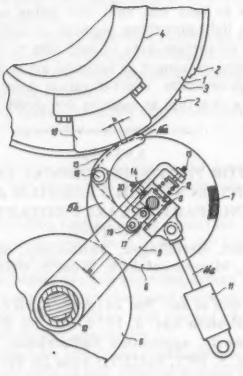


backing tape passes the label separating means under sufficient tension to separate a label from the backing tape.

3,934,508
METHOD AND APPARATUS FOR ADJUSTING ROLLERS IN A PRINTING PRESS

Paul Heimlicher, Bolligen, Switzerland, assignor to Maschinenfabrik Wifag, Switzerland

Filed Feb. 11, 1974, Ser. No. 441,442
Claims priority, application Sweden, Feb. 14, 1973, 7302098
Int. Cl.² B41F 31/10
U.S. Cl. 101—349 7 Claims



1. A device for adjusting the positions of rollers in a printing machine comprising a first roller, a stationary axle rotatably mounting said first roller, a second roller spaced from said first roller, a movably displaceable third roller arranged to contact said first and second rollers, first means connected to said stationary axle and supporting said third roller and fixably positioning it relative to said first roller so that a fixed distance is maintained between the axle of said third roller and the axle of said first roller and a fixed area or strip of contact is established between said first and third rollers, said first means includes a stop surface connected to said third roller and spaced from the strip of contact between said first and second rollers, said second roller having a stop thereon, second means operatively connected to said first means for movably displac-

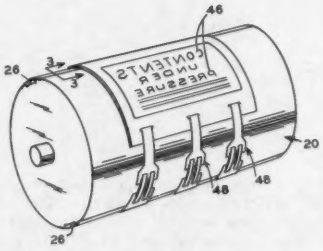
ing said first means about said stationary axle for placing said stop surface connected to said third roller into contact with said stop on said second roller and for establishing a strip of contact between said second and third rollers while maintaining the distance between the axle of said third roller and the axle of said first roller, said first means comprises a first lever pivotally mounted on said stationary axle and extending outwardly therefrom, a bearing rotatably mounting said third roller and slidably mounted on said first lever for movement toward and away from said stationary axle, a biasing member positioned on said first lever for forcing said bearing and third roller toward said first roller, a fixing device on said first lever for fixably positioning said bearing and said third roller relative to said first roller, said stop surface on said first means comprises an angle-shaped second lever pivotally connected intermediate its ends to said third roller, said second lever having a first arm and a second arm each extending from the point of pivotal connection to said third roller and angularly disposed relative to the other, said first arm forms said stop surface for contact with said second roller, a link, a pin connecting said link at one end to said second arm of said second lever at a position spaced from the pivotal connection of said second lever to said third roller, and an eccentric bolt connecting the other end of said link to said bearing for said third roller so that the distance between said bearing and the pin connection of said link to said second arm can be varied by rotating said eccentric bolt.

3,934,509

MOUNTING MEANS FOR A PRINTING PLATE

Philip G. Saunders, and Jack R. Simpson, both of Toledo, Ohio, assignors to Container Graphics Corporation, Toledo, Ohio

Filed Apr. 8, 1974, Ser. No. 458,910
Int. Cl.² B41F *27/06*; B65D *67/02*
U.S. Cl. 101—415.1 **5 Claims**



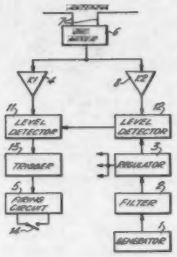
1. Apparatus for printing indicia on surfaces, said apparatus comprising a printing plate cylinder having at least two mounting flanges affixed thereto, a mounting sheet having a downwardly-turned lip along one edge thereof engaged with one of said mounting flanges, said mounting sheet also having a plurality of openings formed along an edge of said sheet opposite the edge having said lip, a printing plate mounted on said mounting sheet between said lip and said openings, and a mounting strap affixing said mounting sheet on said cylinder with said lip engaged with one of said mounting flanges, said mounting strap having a first portion received in one of said mounting sheet openings and having a second portion with a lip engageable with another of said mounting flanges of said cylinder, and resilient means connecting said two strap portions and being in tension when said first portion is connected to said mounting sheet and said second portion is connected to the mounting flange, said first portion of said mounting strap having an elongate strip of a width less than the width of one of said mounting sheet openings, a portion of said elongate strip being received through said one mounting sheet opening with said strip portion folded back between the remaining portion of said elongate strip and the surface of said printing plate cylinder, said elongate strip being made of a plastic material which can be folded by hand back on itself repeatedly at substantially any location along its length, said elongate strip being sufficiently rigid to hold said mounting sheet on said printing plate cylinder when folded back and said resilient means is under tension, said first portion of said mounting strap also having an enlarged portion at the end of said elongate strip opposite said elongate strip portion which is folded back, said enlarged portion having means for receiving and holding said resilient means connected with said second portion of said mounting strap.

3,934,510

PROXIMITY FUSE

Bjorn Dahl, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrik, Kongsberg, Norway

Continuation-in-part of Ser. No. 340,034, March 12, 1973, Pat. No. 3,802,343. This application Mar. 25, 1974, Ser. No. 454,611
Claims priority, application Norway, Mar. 26, 1973, 1223/73
Int. Cl.² F42C *13/04*
U.S. Cl. 102—70.2 P **8 Claims**



1. Proximity fuse, comprising at least two frequency selective amplifiers having different band-pass characteristics and both receiving the same input signals, said first amplifier (K1) including a relatively narrow band-pass filter and being connected to activate a detonator upon receiving a signal exceeding a given level within the pass-band thereof, said second amplifier (K2) including a relatively broad band-pass filter and being adapted to change the level which a signal in the first amplifier (K1) must exceed in order to activate the detonator, if a signal exceeding a certain level appears in the pass-band of the second amplifier.

3,934,511

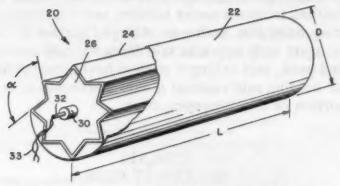
LINEAR SHAPED CHARGE WARHEAD

Paul E. Cordle, and Melvin J. McCubbin, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1968, Ser. No. 753,038
Int. Cl.² F42B *3/08*, *1/02*
U.S. Cl. 102—24 HC **1 Claim**

1. A destructive warhead comprising;
an explosive charge of generally cylindrical formation having longitudinally extending corrugations formed in the periphery thereof;
said corrugations being defined by vanes having, side walls meeting at apices, and open mouths;
with a side wall of one groove meeting the side wall of the next adjacent groove;
the angle between the side walls relative to each apex being on the order of approximately 120°;
said explosive charge being a homogeneous mass of high order explosive material;

said charge being uniformly covered with metal to the extent that the ratio of charge to metal per unit length is in the range of about 1.8 to about 2.25; and



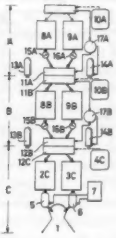
the length to diameter ratio of the charge is at least three.

3,934,512

LIQUID FUEL MULTISTAGE ROCKET

Kazuhide Adachi, No. 3393-7 Banchi, Sunagawa, Tachikawa, Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,699
Claims priority, application Japan, Dec. 3, 1973, 48-135961
Int. Cl.² F02C 3/12
U.S. Cl. 102—49.4 5 Claims



1. A liquid fuel multistage rocket comprising:

a thrust stage body located at the lowermost stage and having a thrust generating device, a combustion chamber, a thrust stage fuel tank, and a thrust stage oxidant tank;

a propellant stage body disposed above said thrust stage body and having a propellant stage fuel tank and a propellant stage oxidant tank;

an open and close valve means coupling said fuel tanks to each other and coupling said oxidant tanks to each other, whereby said propellant stage fuel and oxidant tanks are emptied of their propellant prior to emptying said thrust stage fuel and oxidant tanks; and

small-sized rocket means on said propellant stage body to separate said propellant stage body from said thrust stage body when said propellant stage fuel and oxidant tanks are empty.

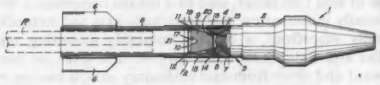
3,934,513

GRENADE-FIRING DEVICE

André J. Gabriëls, Genk, Belgium, assignor to Fabrique Nationale Herstal S.A., Liege, Belgium

Filed June 17, 1974, Ser. No. 480,170
Int. Cl.² F42B 11/42; F41C 27/06
U.S. Cl. 102—65.2 4 Claims

1. A device for firing a grenade or the like from a weapon such as a gun, comprising: a tube affixed to the rear of the grenade, a bullet trap in the said tube, said trap comprising a steel mass, dimensioned to correspond to the said tube and having, near each of its ends, at least one centering edge resting on at least one of the inner wall of the said tube and a portion of the body of the grenade; a supplementary propellant charge in said tube adjacent said mass, the said mass being provided with vent passages, enabling a propelling gas from a



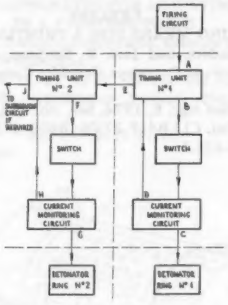
gun to pass from the rear of the said mass to the said supplementary charge and, from there, to the front of the said mass.

3,934,514

FIRING DEVICES AND PROCESSES

Maxwell John Dawkins, Nunawading, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed May 8, 1973, Ser. No. 358,348
Claims priority, application Australia, May 29, 1972, 9137/72
Int. Cl.² F42C 11/06
U.S. Cl. 102—70.2 R 16 Claims



1. Electrical timing and control apparatus for sequentially activating a plurality of electrical load circuits at predetermined and controllable successive timing intervals after the occurrence of a first starting signal wherein the activation sequence is automatically halted whenever any one of the electrical load circuits fails to be successfully activated, said apparatus comprising:

first timing means connected to receive said first starting signal and to produce a first timed output signal which defines a first preselected timing interval,

first activation means connected to activate a first electrical load circuit at a first time corresponding to the time occurrence of saidi first starting signal,

first feedback means connected to detect the successful activation of said first electrical load circuit and to produce a first feedback signal in response thereto,

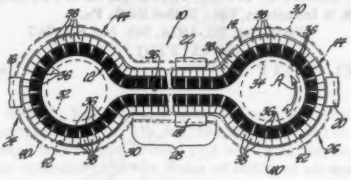
first logic means connected to receive both said first timed output signal and said first feedback signal and to produce a second starting signal occurring at a time interval subsequent to said first starting signal as determined by said first preselected timing interval, said second starting signal only being produced if both said first feedback signal and said first timed output signal are received by said first logic means, and

second activation means connected to activate a second electrical load circuit at a second time corresponding to the time occurrence of said second starting signal.

3,934,515
TRANSPORTATION SYSTEM

Walton W. Cushman, Fraser, Mich., assignor to Lon H. Romanski, Sterling Heights, Mich.

Division of Ser. No. 304,903, Nov. 9, 1972. This application Nov. 25, 1974, Ser. No. 526,916
Int. Cl.² B61K *1/00*
U.S. Cl. 104—18 17 Claims

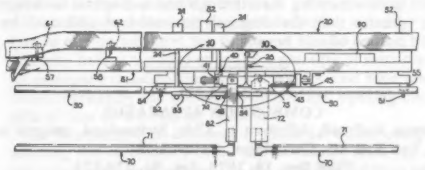


1. A method of transporting an entity to be transported from a first stationary station area to a second stationary station area, comprising the steps of transferring said entity from said first stationary station area to a second area defined by first means standing in stationary relationship to said first stationary station area, accelerating said first means until said first means attains a velocity substantially equivalent to the existing velocity of second means defining a third area contiguous to said second area, transferring said entity from said second area to said third area, transporting said entity on said third area at said existing velocity for a distance less than the distance between said first stationary station area and said second stationary area, transferring said entity from said third area while at said existing velocity to said second area, controllably decelerating said first means from said existing velocity until said first means attains a stationary relationship with respect to said second stationary station area, and transferring said entity from said second area to said second stationary station area.

3,934,516
BATCHING AND DISPERS..NG ASSEMBLY FOR A CONVEYOR SYSTEM

Marius F. Paglia, Calabasas Park, Calif., assignor to Paglia Automated Conveyor Engineering, Inc., North Hollywood, Calif.

Filed July 24, 1974, Ser. No. 491,213
Int. Cl.² B65G *17/42*
U.S. Cl. 104—172 S 13 Claims



7. A system for batching and dispersing trolleys, in a conveyor system having an upper track containing a driving chain coupled to a trolley drive capturing means, and a lower track spaced a first distance from said upper track for supporting said trolleys, said trolleys having a first and second end, said system for batching and dispersing comprising;

a. a batching portion wherein a plurality of trolleys may be transported in a group, said batching portion being formed by spacing said lower track from said upper track a second distance, said second distance being greater than said first distance and sufficient to permit said drive capturing means to pass over said trolleys;

b. a dispersing assembly for accumulating said trolleys from said batching portion and for individually dispatching said trolleys into said conveyor system, said dispersing section comprising a stop means for blocking the path of said trolleys;

c. a plurality sensing means for activating said stop means;

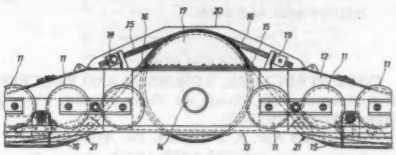
d. a driving means for forcing batched trolleys through said batching portion and disbursing assembly, said driving means being flexible and coupled to said driving chain and capable of bending and sliding over said trolleys as said trolleys accumulate;

e. an anti-reversing means for preventing a stopped trolley from disengaging said stop means.

3,934,517
CABLE CONNECTION WITH SLACK CABLE-BRAKE RELEASE FOR AN AERIAL CABLEWAY

Emil Hirsig, Thun, Switzerland, assignor to Willy Habegger, Thun, Switzerland

Filed Nov. 11, 1974, Ser. No. 522,584
Claims priority, application Switzerland, Nov. 20, 1973, 16278/73
Int. Cl.² B61B *7/02, 12/06*
U.S. Cl. 104—173 11 Claims

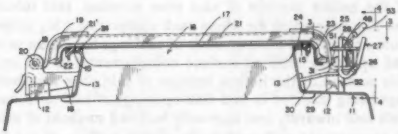


1. In an aerial cableway having a travelling mechanism, a traction cable secured to said travelling mechanism and a brake release mechanism operatively connected to said traction cable and operable in response to a drop of the tension in the traction cable below a predetermined minimum value, the improvement comprising: a damping mechanism arranged at said travelling mechanism, said traction cable being guided over said damping mechanism to counteract oscillations in said cable, a cable drum, said traction cable being wrapped around said cable drum and secured to said travelling mechanism, a force measuring device for deflecting the traction cable in an oscillation free-range thereof between said damping mechanism and said cable drum, said force measuring device being operatively connected to said brake release mechanism so as to cause said brake release mechanism to respond upon a predetermined value of the force of the cable exerted upon said force measuring device.

3,934,518
TROUGH HATCH LOCK DEVICE

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Company, Chicago, Ill.

Filed Oct. 15, 1974, Ser. No. 514,341
Int. Cl.² B61D *39/00*
U.S. Cl. 105—377 6 Claims



1. A hopper hatch structure with a roof having an opening surrounded by a hatch coaming and a hatch cover means movably mounted on said roof for engagement with said hatch coaming to close said hatch opening,

a locking bracket connected to one side of said hatch cover in the closed position of said cover extending outwardly of said coaming,

said locking bracket having a horizontally extending element projecting outwardly of said coaming over said roof, the improvement comprising:

a latching mechanism for securing said cover in the closed position including;

a hold down arm,

means pivotally connecting said arm to said roof whereby said arm is swingable into hold down engagement over said horizontal projecting element,

keeper means for securing said arm in said hold down position comprising;

a first vertical guide member supported on said roof,

hook means projecting laterally outwardly and downwardly from said first guide member,

a second vertical guide member laterally disposed with respect to said first guide member for guiding said arm in a lateral direction,

said arm having limited lateral movement with respect to said guide members and being movable into locked position downwardly in engagement with said second vertical guide member, then laterally into engaging relation with said hook.

3,934,519

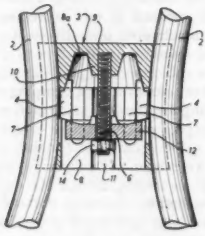
CORE STRUCTURE, ASSEMBLY AND PROCESS

Didier Marceau Petit, Route du Vieux Moulin, Vincy Reuil Magny, France (02340)

Filed Apr. 8, 1974, Ser. No. 458,554

Int. Cl.² A47B *13/02*

U.S. Cl. 108—150 **7 Claims**



1. An assembly comprising a core structure and a plurality of tubular or rod-like supporting members for a table or other article, said core structure comprising a core member having a top, a bottom, a side connecting the top and bottom, and a hollow interior portion open at the bottom, a plurality of external grooves in the side extending generally in a top to bottom direction, a side opening in each of said external side grooves communicating with said hollow portion, the hollow portion of said core member having inclined side surfaces sloping inwardly and upwardly from an area adjacent the upper ends of the interior of said side openings toward the top of the hollow portion of said core member, said tubular or rod-like supporting members each comprising a lug projecting from and affixed thereto, each of said lugs having an inwardly and upwardly inclined surface complemental to the inclined side surface of the hollow interior of said core member, said lugs being inserted in said side openings of said core member with said inwardly and upwardly inclined surfaces of said lugs in engagement with said inclined side surface of the hollow interior portion of said core member, and with the sides of said tubular or rod-like supporting members positioned in said external grooves each of said lugs on said supporting members also having a downwardly and inwardly sloped surface, clamping means comprising a plate, the upper edges of which have a sloping surface complemental to the downwardly and inwardly sloping surfaces of said lugs, and means for holding said plate in locked position with the sloping surfaces of said plate clamped against the downwardly and inwardly sloping surfaces of said lugs.

3,934,520

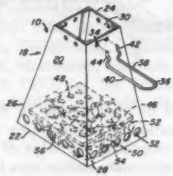
CHARCOAL STARTER

Martin J. Brennan; Vernon D. Klawonn, both of Bethel Park, and Edward K. Browne, Pittsburgh, all of Pa., assignors to K & B Industries, Inc., Bethel Park, Pa.

Filed Oct. 10, 1974, Ser. No. 513,767

Int. Cl.² F23Q *13/00*

U.S. Cl. 110—1 F **6 Claims**



1. A charcoal starter comprising,

a tapered housing arranged to rest vertically on a supporting surface and being formed by interconnecting quadrilateral sidewalls to define an open top portion and an open base portion with said base portion having an area greater than said top portion,

a plurality of spaced apart air inlet apertures extending through each of said sidewalls at the lower portions thereof and openings extending through each of said sidewalls at the upper portions thereof,

handle means having end portions detachably engageable with said openings of one of said housing sidewalls for lifting said housing into and out of position on said supporting surface,

means for supporting charcoal to be ignited within said housing above said air inlet apertures of said housing sidewalls, said charcoal supporting means positioned for vertical movement within said housing,

said handle means including means for securing said charcoal supporting means within said housing for storage of said charcoal starter when said handle means is detached from engagement with said openings in one of said sidewalls, and

said charcoal supporting means having a plurality of apertures extending therethrough and a diagonal dimension greater than the diagonal dimension of said open top portion of said housing.

3,934,521

COMBUSTION APPARATUS

Bruno Andreoli, Affoltern a. Albis, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed Dec. 19, 1974, Ser. No. 534,171

Claims priority, application Switzerland, Feb. 14, 1974, 2105/74

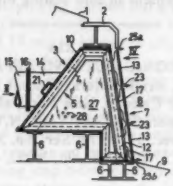
Int. Cl.² F23G *5/04*; F23B *1/20*; F23L *9/06*

U.S. Cl. 110—15 **39 Claims**

1. A combustion apparatus, comprising a pre-drying grate (1, DR1), a combustion device (9, DR9) following the grate (1, DR1), a combustion chamber (100) above said device (9, DR9), and a drop (8, 8*a*, 8*c*, 8*d*) which is intermediate the grate (1, DR1) and the combustion device (9, DR9) and down which material to be combusted falls, wherein there is the improvement that:

at least part of said drop (8, 8*a*, 8*c*, 8*d*) is constituted as a front wall (7, 7*a*, 7*b*, 7*c*) of an air distribution box (3, 3*a*, 3*b*, 3*c*, 3*d*) extending over substantially the whole width

(*b*1, *b*2) of the grate (1, DR1) and connected to air supply means (14, 15, 30, 51, 52) for supplying air to said box (3, 3*a*, 3*b*, 3*c*, 3*d*), and



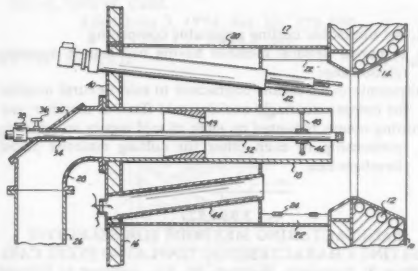
said wall (7, 7*a*, 7*b*, 7*c*) is provided with air throughflow apertures (13*s*, 17, 17*a*, 23, 33*a*, 50*a*, 75, 76*a*) so dimensioned that air passes from said box (3,3*a*, 3*b*, 3*c*, 3*d*) to said chamber (100) in zones of different air speed, including zones of relatively higher air speed on each lateral side of said combustion chamber.

3,934,522

COAL BURNING SYSTEM

Leonard Booker, St. Clair, Mich., assignor to The Detroit Edison Company, Detroit, Mich.

Filed Nov. 1, 1974, Ser. No. 520,000
Int. Cl.² F23D *17/00*
U.S. Cl. 110—22 R **12 Claims**



1. A firebox, a generally tubular burner barrel having an inner end adjacent the inner wall of said firebox and positioned to project fuel particles in a stream of primary air into the firebox for combustion therein a tube extending axially within said barrel for supplying fuel deflecting air under pressure to a zone adjacent the inner end of said burner barrel, said tube having a closed end, and a plurality of restricted air jet passages extending through the wall of said tube and inclined rearwardly and outwardly thereof and opening into the path of flow of the fuel-air mixture.

12. The method as defined in claim 11 which comprises directing the multiplicity of air jets outwardly from the zone and rearwardly with respect to the direction of flow of the stream of air and suspended particles.

3,934,523

METHOD AND APPARATUS FOR REMOVING MOLTEN WASTE FROM A FURNACE

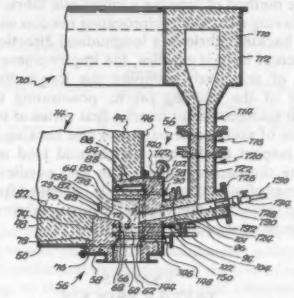
Frank A. Bercynski, Clarence; Jack J. Fritz, Buffalo, and Theodore W. Lucas, Jr., Williamsville, all of N.Y., assignors to Andco Incorporated, Buffalo, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,625
Int. Cl.² F23J *1/00*
U.S. Cl. 110—165 R **20 Claims**

1. In a furnace wherein solid material is exposed to hot gas in a manner forming a liquid waste, said furnace including means for distributing hot gas to the interior of said furnace, apparatus for removing said liquid waste from said furnace to an outlet comprising:

a. means for defining a discharge passage directing the liquid waste material from the interior of said furnace to the outlet; and

b. means for supplying hot gas to the liquid waste material flowing from the interior of said furnace through said discharge passage to the outlet to maintain the liquid waste material in a flowing state said means for supplying hot gas to the liquid waste material comprising conduit means having an inlet connected to said hot gas distributing means of said furnace and an outlet in communication



with said discharge passage and located so as to direct hot gas onto the flow of liquid waste material.

17. A method of removing liquid waste material from a furnace wherein hot gas is supplied to the furnace and solid material is exposed to said hot gas in a manner forming said liquid waste material, comprising the steps of:

a. providing a discharge path for directing said liquid waste material to flow from the interior of said furnace to an outlet; and

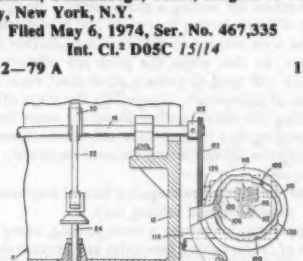
b. withdrawing a portion of said hot gas before it is supplied to the furnace and conveying said hot gas to said liquid waste material flowing from said furnace along said discharge path to maintain said liquid material in a flowing state.

3,934,524

MACHINE AND METHOD FOR PRODUCING DENSE PILE FABRIC

Randel P. Smith, Chattanooga, Tenn., assignor to The Singer Company, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,335
Int. Cl.² D05C *15/14*
U.S. Cl. 112—79 A **11 Claims**



1. In a tufting machine including a bank of laterally spaced needles, a needle plate for supporting a backing fabric relative

to said needles, means for actuating the needles to penetrate the needle plate and the backing fabric thereon and to insert a series of tufts of yarn into the backing fabric upon each penetration of the needles, means for feeding the backing fabric longitudinally of the needle plate, control means for selectively rendering the feeding means inoperative during at least two successive penetrations of the needles into the backing fabric in accordance with a pattern, and means operative while the feeding means is inoperative for imparting relative lateral movement between said needles and said backing fabric in accordance with a pattern, whereby more than one series of tufts may be selectively inserted laterally into the backing fabric on successive penetrations of the backing fabric by the needles while the feed is inoperative.

5. In the method of forming a tufted pile fabric by a tufting machine having a bank of reciprocating needles and means for feeding a backing fabric in a longitudinal direction for penetration thereof by said needles, the improvement comprising the steps of selectively stopping the longitudinal feeding movement of the backing fabric, penetrating the backing fabric with said needles to insert a first series of tufts therein; shifting one of said needle bank and said backing fabric laterally with respect to the other while said feed is stationary, penetrating the backing fabric with said needles to insert a second series of tufts therein laterally displaced from said first series, and thereafter feeding said backing fabric at least one discrete increment of feed length.

3,934,525

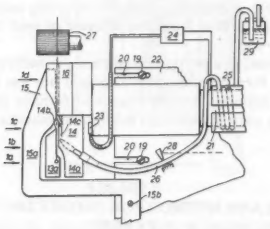
TEXTILE PROCESS

Justin Anderson Aldred, Manchester, England, assignor to Ilcor GmbH, Chur, Switzerland

Continuation-in-part of Ser. No. 428,051, Dec. 26, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 573,084

Int. Cl.² D05B *35/02*; D06F *71/30*

U.S. Cl. 112—217 **18 Claims**



1. A method for setting a seam joining, along a seam line, two plies of fabric having face sides and reverse sides similarly orientated with respect to the seam, and further having seam allowances, so that when the plies are separated the seam allowances will tend to remain in contact each with the reverse side of its own ply, comprising the steps of:

a. feeding the plies together along the seam line;

b. separating and folding back the seam allowances;

c. setting the fabric during the said separating and folding step; and

d. constraining the seam against lateral displacement during said separating and folding step.

10. Apparatus for setting a seam joining, along a seam line, two plies of fabric having face sides and reverse sides similarly orientated with respect to the seam and further having seam allowances, so that when the plies are separated the seam allowances will tend to remain in contact each with the reverse side of its own ply, comprising

a fabric edge folder comprising tongue means adapted to divide adjacent edges of the two plies of fabric fed thereto, guide means adapted to turn said edges so that said edges lie against the outwardly facing reverse sides of the plies, and pressing means adapted to press the thus turned edges together; setting means adapted to set the fabric edges in said turned back condition; and seam constraining means adapted to locate the seam against lateral displacement in said setting means.

3,934,526

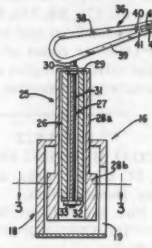
ULTRASONIC CUTTING APPARATUS

Martin A. Damast, Brightwaters; Vincent P. Abberton, Westbury, and Kusler Celestin, New York, all of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,092

Int. Cl.² D05B *65/00*; H01L *41/00*

U.S. Cl. 112—252 **18 Claims**



1. An ultrasonic cutting apparatus comprising

a U-shaped flexural member having two legs in opposing relationship;

ultrasonic drive means connected to said flexural member for communicatingly exciting said flexural member; and

cutting means mounted on each of said legs in an opposing relationship to each other for cutting material placed therebetween.

3,934,527

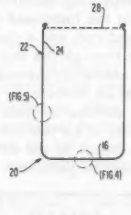
MANUFACTURING METHODS FOR SELECTIVE COATING CHARACTERISTIC TINPLATED STEEL CANS

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Aug. 9, 1973, Ser. No. 387,043

Int. Cl.² B63B *19/00*

U.S. Cl. 113—120 A **4 Claims**



1. Method of manufacturing a one-piece container body to provide a uniformly tin coated surface for exposure to container contents while protecting remaining interior surfaces from exposure to container contents comprising the steps of

providing a flat rolled steel sheet metal blank having a surface substantially uniformly coated with tin by blanking electrotinplated flat rolled steel which has been electrotinplated in continuous strip form with a tin coating thickness on the substantially uniformly coated surface in the range of 10 micro-inches to about 90 micro-inches,

forming the tin coated sheet metal blank into a cup having a bottom wall and unitary sidewall with such tin coating on interior bottom wall and interior sidewall surfaces, such forming step being carried out while maintaining the tin coating thickness on the interior bottom wall surface in the range of 10 micro-inches to about 90 micro-inches in thickness during forming,

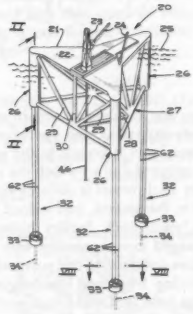
Ironing the sidewall of such unitary cup to provide a reduction in the thickness gage of the sidewall sheet metal over a major portion of its area in the range of about 25% to about 75% and a corresponding reduction in the thickness of the tin coating on the interior surface of the sidewall, such ironing step being carried out while maintaining the tin coating thickness on the interior bottom wall surface in the range of 10 micro-inches to about 90 micro-inches in thickness, and

applying a protective coating to the thinned tin coating on the ironed interior sidewall surface to substantially eliminate possible contact of such thinned tin surface with container contents while maintaining exposure of the tin coating maintained on the interior bottom wall surface for direct contact with container contents.

3,934,528
MEANS AND METHODS FOR ANCHORING AN OFFSHORE TENSION LEG PLATFORM

Edward E. Horton, Portuguese Bend; John H. Brewer, Irvine; William H. Silcox, Newport Beach, and T. A. Hudson, Balboa Island, all of Calif., assignors to Deep Oil Technology, Inc., Long Beach and Chevron Oil Field Research Co., La Habra, both of, Calif.

Filed June 3, 1974, Ser. No. 475,800
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 D **20 Claims**



1. In a method of anchoring a floating offshore platform apparatus having tension anchor lines, said anchor lines being generally vertically disposed and the offshore platform apparatus having a buoyant support means including an upstanding buoyant support member, a supply of flowable ballast material on said apparatus, and an anchor means having anchor compartments therein for said ballast material, said anchor means being transportable at the bottom of said buoyant support member;

flooding ballast tanks in said buoyant support means to lower said apparatus to a selected depth;

setting tension lines to a selected depth;

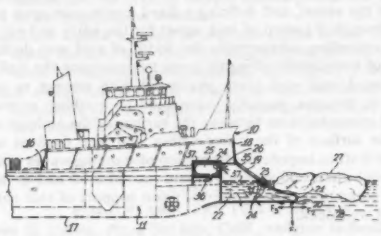
lowering said anchor means with substantially empty anchor compartments by drill pipe;

and transferring said ballast material from the supply of ballast material through said buoyant support member and drill pipe to said anchor compartments.

3,934,529
ICEBREAKING VESSELS

John Patrick Gallagher, Calgary, Canada, assignor to Canadian Marine Drilling Ltd., Calgary, Canada

Filed Oct. 30, 1974, Ser. No. 519,484
Claims priority, application Canada, Sept. 16, 1974, 209254
Int. Cl.² B63B *35/08*
U.S. Cl. 114—40 **5 Claims**

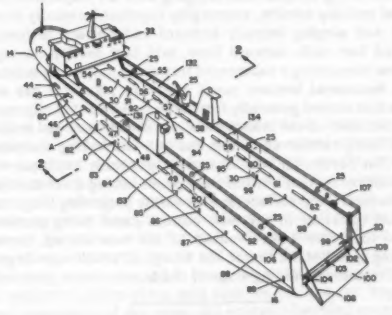


1. A procedure for breaking ice which comprises the cyclical steps of: pretensioning an ice sheet by plowing under a portion of the icesheet with a plow portion of the bow of an icebreaking vessel; providing a mass of water within a chamber disposed within said plow portion of the bow of said vessel; and applying, to the mass of water in said chamber, exhaust gases from a combustion chamber, said gases having a pressure of at least about 700 psi thereby rapidly expelling said mass of water, in the form of a single free piston, and superimposing on said pretensioned ice sheet, a massive upward momentum force due to the upward reaction of the downwardly expelled water.

3,934,530
TRANSPORT VESSEL FOR FLOATING ONLOADING AND OFFLOADING OF CARGO

Miklos M. Kossa, Berkeley, and David J. Seymour, Daly City, both of Calif., assignors to Inter-Hull, Seattle, Wash.

Filed Oct. 17, 1974, Ser. No. 514,859
Int. Cl.² B63B *35/28*
U.S. Cl. 114—43.5 VC **5 Claims**



1. A vessel for transporting floatably onloaded and offloaded cargo comprising: a hull having a raised bow section for providing buoyant support forward of said vessel at all drafts thereof; a well deck mounted interiorly of said hull extending substantially horizontally parallel to the waterlines of said hull, said well deck adapted to support on said hull said cargo; at least one ballast volume defined within said hull for permitting said hull to float at a first shallow draft when said ballast volume is empty, said ballast volume when empty being of sufficient displacement with respect to said hull to maintain

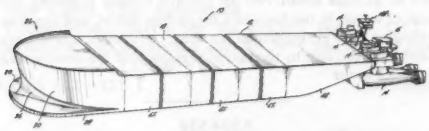
said well deck above the waterline of said vessel with said well deck fully loaded with cargo, and at a second deeper draft when said ballast volume is full of ballast, said well deck submerged at said second draft to provide for floating of the cargo thereover to place said cargo thereon; means for flooding and emptying said ballast volume of ballast; a wall extending upwardly from said well deck at the bottom to a preselected elevation above said well deck, said wall extending from the bow along the port side of the vessel, the starboard side of the vessel, and defining a fixed continuous open passage through the stern of said vessel for the entry and exit of cargo extending substantially the width of said well deck; a series of horizontally elongate ports transpiercing the wall of said vessel; and said ports positioned with respect to said vessel to become partially submerged to establish uninterrupted communcation between the surface of the ambient sea and the surface of the water within said well deck at said second draft to impede the formation of standing waves within the vessel when said vessel is at said second draft and to raise above communication to the sea upon support of said cargo on said well deck.

3,934,531

OCEAN GOING CARGO TRANSPORT SYSTEM

Rudolph A. Allen, 1419 Second West, Apt. 303, Seattle, Wash. 98119

Filed July 18, 1974, Ser. No. 489,762
Int. Cl.² B63B 9/00
U.S. Cl. 114—63 **25 Claims**



1. An ocean going cargo transport comprising a cargo vessel hull having an elongated generally flat-bottomed midship section, and stern and bow sections joined to the respective aft and forward ends of said midship section, and propulsion means operable to propel said hull at cruising speed, said midship section having substantially vertical sides extending downwardly substantially to the plane of its bottom, said bow section having upright sides merging with the respective sides of said midship section, converging together forwardly therefrom, and sloping laterally outward and upward to form a tapered bow with outward flare, said bow section having a bottom comprising a submerged forwardly projecting substantially horizontal bottom panel which in planform has side edges that extend generally forwardly in substantial alignment with the sides of the midship section, said submerged bottom panel being cantilevered from the hull and having a substantially flat horizontal bottom surface generally coplanar with the midship section bottom, said panel having a substantially flat horizontal top surface, the forwardly projecting length and vertical thickness of the bow bottom panel being predetermined to create a wave ahead of the bow during forward cruising speed of the vessel, the trough of which wave is presented to the converging sides of the bow.

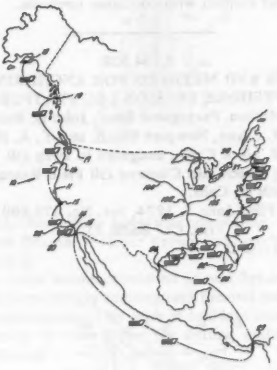
3,934,532

MARINE TRANSPORT

John J. Bylo, 7272 Willoughby Ave., Los Angeles, Calif. 90046

Continuation-in-part of Ser. No. 187,537, Oct. 7, 1971, Pat. No. 3,793,974, which is a continuation-in-part of Ser. No. 794,938, Jan. 29, 1969, abandoned. This application Feb. 4, 1974, Ser. No. 439,375
Int. Cl.² B63B 25/00
U.S. Cl. 114—72 **1 Claim**

1. A marine transport system comprising, in combination, a plurality of modular cargo hold units of generally uniform external configuration and dimension over at least the lower portions thereof, a plurality of self-propelled shuttle vessels for moving cargo hold units between a plurality of at least three ports in the system, the system encompassing a route composed of a plurality of substantially serially connected different subroutes each of which is defined between two adjacent ports in the system whereby the system includes at least one port common to two subroutes, each shuttle vessel being configured to mate with at least any one of the hold units and to support the same, each hold unit being sized relative to the shuttle vessels when loaded and mated with any one of the shuttle vessels to consume a substantial fraction of the load-carrying capacity of the shuttle vessel, each vessel including ballasting means for buoyantly raising and lowering the vessel into and out of mating and load transferring relation to a hold unit supported above the vessel at a dock facility in the system, each shuttle vessel being defined and equipped as to propulsive machinery, and crew accommodations, hull



form and proportion, and similar features in consideration of the navigational, meteorological, and operational factors pertinent to a particular system subroute in the system to which the shuttle vessel is assigned and on which the vessel is primarily operated whereby each vessel is different from most or all of the other vessels in the system, and a dock facility in each port in the system, each dock facility being cooperatively configured and arranged in cooperation with the vessels assigned to the subroutes common to the port and with the cargo hold units for receiving from and discharging to a shuttle vessel a loaded cargo hold unit and for supporting a received hold unit for the loading and unloading of cargo to and from the hold unit in the absence of a vessel at the dock facility, whereby, in moving a hold unit from one port on one subroute in the system to a second non-adjacent port on another subroute in the system, the hold unit is movable bodily from shuttle vessel to shuttle vessel at each port in the system intermediate the one port and the second port via the dock facilities in the intermediate ports.

3,934,533

AEROFOIL OR HYDROFOIL

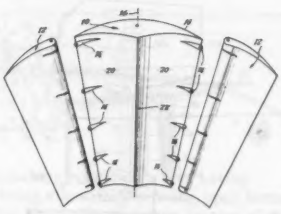
Barry Wainwright, 36 Southdown Road, Westbury-on-Trym, Bristol, England

Filed Sept. 12, 1973, Ser. No. 396,471
Int. Cl.² B63H 9/04
U.S. Cl. 114—103 **9 Claims**

1. An aerofoil or hydrofoil, comprising:
a central panel having a central axis extending spanwise, said central panel being of symmetrical cross section of each side of said axis and having two opposite side edges;

at least two lateral panels each having first and second side edges;

means hinging each of said two lateral panels adjacent said first side edge thereof to said central panel at a respective one of said two opposite side edges of the central panel, to provide two alternative leading edges so that each lateral panel may pivot between an extended condition and a folded condition wherein the respective lateral panel is doubled back upon at least one of the central panel and the respective other lateral panel, to provide two alternative leading edges, the two lateral panels being of similar cross-section, and generally symmetrical with



respect to said central axis, so that when said one lateral panel is extended and the other is folded an aerofoil or hydrofoil that is nonsymmetrical in cross-section is formed, which is substantially a mirror image of the aerofoil or hydrofoil which may be formed by extending said other lateral panel and folding said one lateral panel, tie means interconnecting the lateral panels to move in concert, as follows: said one lateral panel folds as said other lateral panel extends and said other lateral panel folds as said lateral panel extends;

the effective leading edge of the aerofoil or hydrofoil incorporating said first side edge of whichever of the lateral panels as is in said folded condition.

3,934,534

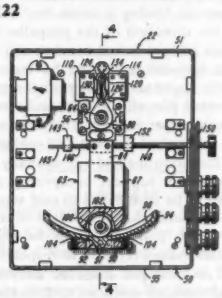
MARINE VESSEL ROLL STABILIZER APPARATUS

Everett P. Larsh, 1001 E. Ridge Lane, Miami, Fla. 33157

Division of Ser. No. 273,331, July 19, 1972, Pat. No. 3,842,777. This application Aug. 16, 1974, Ser. No. 498,171

Int. Cl.² B63B *39/00*

U.S. Cl. 114—122 **10 Claims**



1. Roll sensor mechanism for a marine vessel for sensing roll movement thereof, of the type having support structure, a pendulum pivotally supported by the support structure, the pendulum being pivotally supported about a given pivotal axis, the improvement comprising:

means for increasingly resisting relative pivotal movement between the pendulum and the support structure, including an engagement member having an arcuate surface, engagement means carried by the pendulum and in engagement with the arcuate surface and movable with respect thereto during relative pivotal movement between the pendulum and the support structure, the arcuate surface forming an arc having a radius less than the spacing between the pivotal axis of the pendulum and the arcuate surface, the center of the arc being spaced between the arcuate surface and said pivotal axis of the pendulum,

means pivotally supporting the engagement member so that relative pivotal movement between the engagement means and the arcuate surface causes pivotal movement of the engagement member,

resilient means resisting pivotal movement of the engagement member and thus resisting relative pivotal movement between the pendulum and the support structure,

and means responsive to relative movement between the pendulum and the support structure for control of roll of the marine vessel.

3,934,535

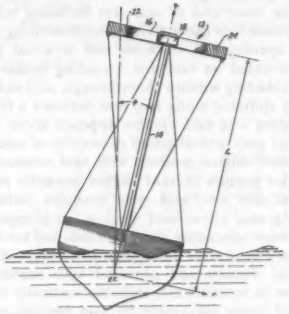
ROLL STABILIZER FOR A BOAT

Irven H. Culver, Playa Del Rey, Calif., assignor to Southwestern Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 360,668, May 15, 1973, abandoned. This application May 15, 1974, Ser. No. 469,950

Int. Cl.² B63B *39/02*

U.S. Cl. 114—124 **9 Claims**

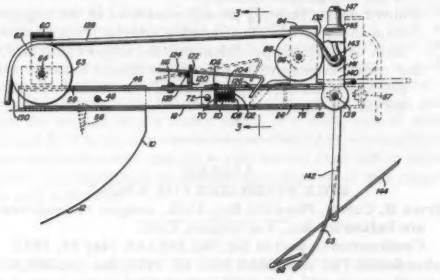


1. A passive non-linear energy absorbing dynamic mass system for limiting the roll of a floating vessel comprising a moving mass, a longitudinal guide member, means movably supporting the mass on the guide member for substantially free and undamped movement along the full length of the guide member, mounting means for mounting the guide member on the vessel with the path of movement of the mass extending transversely to the roll axis of the vessel, the energy absorbing means secured to the guide member and positioned at separated points along said path for limiting the length of free movement of the mass, the energy absorbing means absorbing substantially all the kinetic energy of the mass from impacts with the moving mass and dissipating it as heat to prevent recoil acceleration of the mass on impact, the amount of free movement of the mass along the guide means between the energy absorbing means being substantially greater than the motion accommodation distance of the energy absorbing means, the mass when the vessel is in a static level position being free along the full length of the guide member between the energy absorbing means of any forces tending to restore the mass to a central position.

3,934,536
EXTENDABLE ANCHOR LINE GUIDE AND SUPPORT WITH AUTOMATIC RELEASE

Frazer W. Galamore, 54 Oak Ave., North Fort Myers, Fla. 33903, and Sheldon S. Fulton, 2001 Triggerfish, Matlacha, Fla. 33901

Filed Nov. 5, 1974, Ser. No. 521,233
Int. Cl.² B63B 21/22
U.S. Cl. 114—210 5 Claims

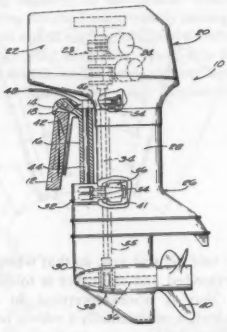


1. An anchor raising and support structure comprising a support arm including inner and outer ends, mounting structure on said inner end for mounting said support arm from a boat in generally horizontal position with the outer end of said support arm projecting outwardly of one marginal portion of the boat, the outer end of said arm including means in the form of opposite side outer terminal ends defining an endwise outwardly opening slot between said terminal ends, slide structure mounted on said arm including means defining a vertically extending window therethrough, said slide structure being freely shiftable along said arm between a first outward shifted position with said window disposed above the level of said terminal ends and disposed outwardly of said slot and a second inward shifted position with said window having at least a major portion thereof shifted inwardly of the outer extremity of said slot, said slide structure including guide structure elevated above said window, an elongated flexible tension member extending along said arm and having one free end portion passed over said guide structure and downward through said window and provided with anchor attaching structure on its terminal end shiftable vertically through said window and being elevatable by said tension member upwardly through said window to a position disposed juxtaposed to and forward of said guide structure for engagement with the latter upon inward displacement of said anchor attaching structure along said arm, said anchor attaching structure being of a width to bridge said terminal ends above the latter when said anchor attaching structure is elevated upwardly through said window, means yieldingly biasing said slide structure toward the first position thereof, depending second guide structure carried by the outer end of said arm for engagement by said anchor attaching structure from below when the anchor attaching structure is raised upward by said tension member toward the outer end of said arm when said slide is in the first position thereof, said second guide structure being operable to cause said anchor attaching structure, when the latter is being elevated upwardly through said window, to be retained outwardly of the first mentioned guide structure and to thereafter allow said anchor attaching structure to move inwardly over said slot and said terminal ends and into engagement with the first mentioned guide structure, whereby the slide structure may be displaced inwardly along said arm toward said second position thereof upon upward displacement of said attaching structure above the second mentioned guide structure, and releasable latch means carried by said arm for releasably latching said slide in said second position, said anchor attaching structure, after said tension member is slackened subsequent to said slide structure being inwardly shifted to said second position thereof, being operable to bridge said terminal ends for support therefrom.

3,934,537
VIBRATION ISOLATING MOUNT FOR AN OUTBOARD MOTOR

Charles B. Hall, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 18, 1974, Ser. No. 524,790
Int. Cl.² B63H 21/26
U.S. Cl. 115—17 22 Claims



1. An outboard motor comprising a transom bracket, a swivel bracket mounted on said transom bracket for vertical tilting movement, a propulsion unit including a drive shaft housing having a lower portion and a rotatably mounted propeller shaft carrying a propeller, means for mounting said propulsion unit from said swivel bracket including a lower mount including an insert connected to said swivel bracket and having a wedge-shaped cross section with upper and lower outer surfaces diverging in the direction of forward propeller thrust, and a resilient pad disposed between each of said insert surfaces and said propulsion unit.

2. An outboard motor comprising a transom bracket, a swivel bracket mounted on said transom bracket for vertical tilting movement, a propulsion unit including a rotatably mounted propeller shaft carrying a propeller, means for mounting said propulsion unit from said swivel bracket including an upper mount having a cross bar which is disposed transversely to the direction of the propeller thrust, which is connected to one of said swivel bracket and said propulsion unit, and which includes a portion having a wedge-shaped cross section with upper and lower surfaces converging in the direction of forward propeller thrust, and a resilient member which engages said upper and lower surfaces and is connected to the other of said swivel bracket and said propulsion unit.

17. A device for mounting and vibrationally isolating vibrating equipment from a support comprising a wedge-shaped member adapted to be connected to said support and having opposed outer surfaces which converge in a direction away from said support, a pair of spacers having inner surfaces located in parallel spaced relation to respective of said member surfaces, a resilient pad disposed between each of said spacers and said member surfaces, and means for connecting said spacers to said equipment.

20. A device for mounting and vibrationally isolating vibrating equipment from a support, which equipment has a neutral axis extending substantially proximate its center of mass and about which said equipment tends to oscillate, comprising a casing adapted to be mounted on said equipment, a cross bar disposed in said casing and having opposed outer ends extending transversely of said neutral axis and outwardly from said casing for connection to said support, said cross bar including a central portion disposed inside said casing and having a wedge-shaped cross section with the opposite outer surfaces

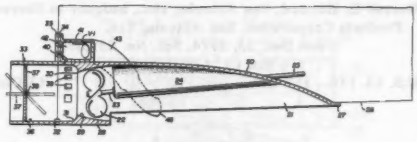
thereof diverging in a direction away from said support, and a resilient bushing having a wedge-shaped cross section disposed inside said casing and encircling said cross bar central portion.

3,934,538

BOAT PROPULSION SYSTEM

H. Donald Canazzi, 178 Jewett Parkway, Buffalo, N.Y. 14214

Filed May 16, 1974, Ser. No. 470,408
Int. Cl.² B63H *5/16*
U.S. Cl. 115—39 **5 Claims**



1. In a propulsion system on a boat having:

means defining a downwardly-facing, open-bottomed recess extending lengthwise along the bottom of the boat and gradually converging to provide a progressively smaller cross-section rearwardly; the improvement which comprises:

an annular shroud defining a passage that is closed at the bottom of the boat and merges smoothly with the back end of said open-bottomed recess and provides a rearward extension of said recess, said passage presenting a venturi throat and having an abruptly increased cross-section behind said throat and terminating in an open back end;

a propellor circumferentially enclosed in said passage just in front of said venturi throat;

means defining one or more openings in said shroud leading into said shroud immediately behind said venturi throat;

auxiliary passage means open at one end thereof to the outside of the boat and communicating at the other end thereof through said openings with the interior of said shroud immediately behind said venturi throat for passing water into said shroud by the venturi action of the water displaced through said throat by the propellor;

said recess providing substantially horizontal and non-turbulent flow of intake water along the bottom of the boat with gradually increasing velocity to the inlet side of the propellor;

and a plate-like valve member in said shroud behind said openings, said valve member being pivoted and movable between an open position substantially parallel to the direction of water flow from said propellor through said shroud and a closed position substantially transverse to said direction.

3,934,539

CHEMILUMINESCENT FOLDABLE SIGNAL DEVICE

Steven M. Little, China Lake; Robert L. Gerber, Ridgecrest; Carl A. Heller, China Lake, all of Calif., and Vincent J. Esposito, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 26, 1974, Ser. No. 454,877
Int. Cl.² E01F *9/00;* **F21L** *17/00*
U.S. Cl. 116—63 P **2 Claims**

1. For use as a signal device to be deployed upon a supporting surface, the combination comprising:

an elongated plastic tubular chemiluminescent light member;

a detachably connected support means effective to maintain said light member at an angle of 45° or more to the surface upon which it is deployed;

said support means comprising;

a tubular cup shaped portion receiving one end of said light member;

a generally square base portion orthogonal to said cup portion; and

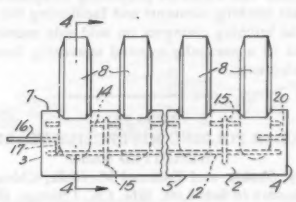
said square base portion having four elongated legs pivotally fastened to the four sides thereof and biased to a position orthogonal to said cup portion so that said legs may be folded together for convenience in storage and yet when said legs are deployed they present four points extending orthogonal to said cup portion.

3,934,540

BARRIER

A. J. Bruner, 2166 Katherine St., Fort Myers, Fla. 33901; Edward T. Foster, 1050 Hollywood Blvd., Hollywood, Fla. 33020, and Thomas N. Kearns, 3500 Pembroke Road, Hollywood, Fla. 33021

Filed Jan. 17, 1973, Ser. No. 324,306
Int. Cl.² E01F *13/00*
U.S. Cl. 116—63 P **10 Claims**



1. A portable barrier section comprising a concrete block and a plurality of tires partially embedded in said block.

3,934,541

TRIANGULAR FOLDING REFLECTIVE TRAFFIC MARKER

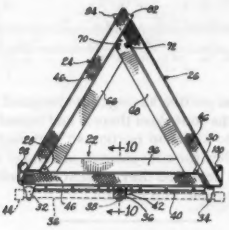
Louis May, Skokie, and Edmund M. Idzik, Chicago, both of Ill.; assignors to the Sate-Lite Mfg. Co., Chicago, Ill.

Filed Oct. 19, 1973, Ser. No. 407,797
Int. Cl.² E01F *9/10*
U.S. Cl. 116—63 T **6 Claims**

1. A triangular folding reflective marker, comprising a reflective base member, and first and second reflective side members having pivotal connections to opposite ends of said base member, said side members being swingable from horizontal folded positions adjacent said base member to inclined erected positions to form the sides of a triangle, said side members having upper end portions with longitudinal flanges adapted to overlap when said side members are in their erected positions, each of said flanges having a latching pin element and a latching slot therein adapted to receive the pin element on the other flange to retain said side members in their erected positions, each of said flanges having detent means adjacent the corresponding slot and forming a detaining fit with the other pin element, whereby said pin elements can be snapped into said slots for retention therein against

accidental disconnection, each of said side members including an end element projecting from the outer end thereof and extending beyond the other side member when said pin elements and slots are latched together, said end elements projecting away from the locations of said pin elements and slots and facilitating the overcoming of said detent means and the disconnection of said pin elements and slots by the application of a manually exerted squeezing force between said end elements on said side members.

4. A triangular folding reflective marker, comprising a reflective base member, first and second reflective side members having pivotal connections to opposite ends of said base



member, said side members being swingable from horizontal folded positions adjacent said base member to inclined erected positions to form the sides of a triangle, and latching elements on the upper ends of said side members for holding said side members together in their erected positions, each of said side members including an end element extending beyond the other side member when said side members are latched together, said end elements projecting away from the locations of said latching elements and facilitating the disconnection of said latching elements on said side members by the application of a manually exerted squeezing force between said end elements.

3,934,542

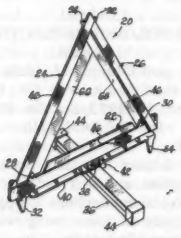
TRIANGULAR FOLDING REFLECTIVE FLARE HAVING WEIGHTED BASE

Louis May, Skokie, and Edmund M. Idzik, Chicago, both of Ill., assignors to Sate-Lite, Mfg. Co., Chicago, Ill.

Filed Mar. 11, 1974, Ser. No. 450,149

Int. Cl.² F01F 9/01; G08B 5/00

U.S. Cl. 116—63 P **2 Claims**



2. A triangular folding reflective flare,

comprising a lower member and two side members movably connected thereto for folding and unfolding movement between a triangular erected position and a folded position with said side members compactly folded relative to said lower member,

and an elongated base having a pivotal connection to said lower member for swinging movement relative thereto between folded and unfolded positions,

said base comprising a generally channel-shaped member having two opposite side walls and a connecting wall extending therebetween with an open side opposite said connecting wall,

a heavy material comprising a heavy aggregate mixed with a binder and received within said channel-shaped member,

and a cover wall secured to said channel-shaped member and closing said open side to retain said heavy material.

3,934,543

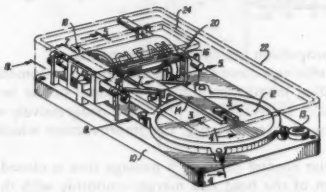
APPARATUS FOR MONITORING THE CONDITION OF A FILTER

Durrell U. Howard, San Antonio, Tex., assignor to Sherwood Products Corporation, San Antonio, Tex.

Filed Dec. 23, 1974, Ser. No. 535,656

Int. Cl.² G01D 21/00

U.S. Cl. 116—114 AD **13 Claims**



1. Apparatus for indicating the condition of a filter in a forced air system comprising:

a base member;

an enclosed chamber mounted on said base member, one wall of said chamber comprising a flexible diaphragm having an interior surface within said chamber and an exterior surface;

means operatively associated with said base member for directing fluid pressure from either the upstream or the downstream side of said filter to either the interior or the exterior side of said diaphragm;

an elongated arm mounted to pivot relative to said base member;

means for pivotally connecting said arm to said flexible diaphragms;

indicator flag means mounted for rotation relative to said base member, said elongated arm contacting said flag means to cause rotation thereof in response to movement of said diaphragm due to changes in the pressure in said system; and

means connected to said indicator flag means for resisting movement of said flag means from a first position indicative of a clean filter until said arm has rotated said flag means a predetermined amount in response to said changes in pressure, and for aiding movement of said flag means to a second position indicative of a dirty filter after said flag means has moved said predetermined amount.

3,934,544

ULTRASONIC WAVE TRANSMITTER MECHANISM

Theodore Dennis Smith, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,037

Int. Cl.² B06B 03/00

U.S. Cl. 116—137 A **9 Claims**

1. An ultrasonic wave transmitter comprising:

a rod responsive to striking thereof mounted for producing an ultrasonic wave;

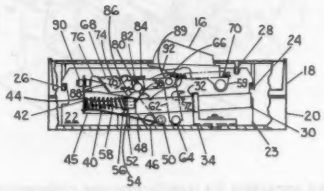
a striking member;

a pivotally mounted means including a guide pin for slidably supporting said striking member for movement relative thereto, said pivotally mounted means rotatable to a first

position with an end of said guide pin in contact with an end of said rod for providing damping controlled thereto and a second position with said end of said pin out of contact with said rod;

an actuating means movable from an initial position to a final position for moving said supporting means from said first position to said second position;

means coupled to said actuating means for engaging and moving said striking member away from said rod during initial motion of said actuating means and, upon a predetermined movement of said actuating means, for releasing said striking member;



a resilient means coupled to one end of said striking member and subject to a compression when said striking member is moved away from said rod, said resilient means imparting a force to drive said striking member when it is released into contact with said end of said rod and thereby generates said waves; and

means coupled to said supporting means and responsive to return of said actuating means to said initial position for moving said pin to said first position in contact with said rod for damping said waves.

3,934,545

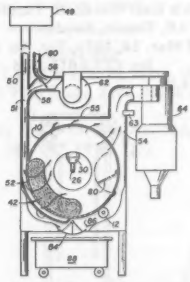
APPARATUS FOR ENROBING DISCRETE OBJECTS

Joseph L. Schady, Beechurst, N.Y., assignor to Alpha Sheet Metal Works, Inc., Woodside, N.Y.

Continuation-in-part of Ser. No. 198,847, Nov. 15, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,362

Int. Cl.² B05C *3/08, 5/00*

U.S. Cl. 118—19 **4 Claims**



1. An apparatus for enrobing discrete objects comprising,

a housing,

perforated drum means rotatable about a horizontal axis within said housing and adapted to receive a charge of discrete objects to be enrobed,

means for rotating said drum means at a presettable speed to selectively tumble a received charge therein over a predetermined portion of the surface thereof,

means for periodically introducing liquid coating material into said drum means to wet the surface of the discrete objects forming said received charge therein,

a source of selectively conditionable air,

inlet conduit means connected to said source of conditionable air for selectively directing a stream of conditioned air onto said predetermined portion of the surface of said perforated drum means for directed passage thereof through said charge being tumbled therein to remove moisture therefrom,

discharge conduit means for directing the flow of moisture enhanced air emanating from said drum means exteriorly of said housing,

blower means connected to said discharge conduit means for inducing a selectively directed flow of air through said inlet conduit means, drum means and discharge conduit means and for varying the velocity of said flow of air,

means disposed intermediate said blower means and said inlet conduit means for effecting direct reintroduction, at a point downstream of said source, of selected portions of the moisture enhanced air passing through said discharge conduit means into said inlet conduit means and conditioned air flowing therethrough to permit a control of its drying characteristics through controlled recirculation thereof, and

whereby said objects being enrobed are subject to controlled variations in drying environment intermediate successive application of liquid coating materials thereto.

3,934,546

APPARATUS FOR FIXING WITH SOLVENT VAPORS

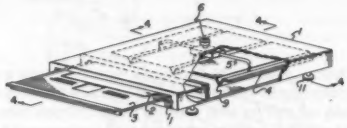
Hideo Fukuzawa, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Dec. 9, 1974, Ser. No. 531,253

Claims priority, application Japan, Dec. 25, 1973, 48-147207

Int. Cl.² B05C *19/02*

U.S. Cl. 118—48 **3 Claims**



1. Fixing apparatus comprising:

a housing having an opening in one side therein and retained in a horizontal position,

a tray located within said housing and movable into and out of said opening,

a solvent vaporizing medium located in a horizontal position in said housing, said medium being formed with at least one groove,

a plurality of rod members within said groove, and

solvent feeding means located above said medium for feeding solvent onto said rod members.

3,934,547

RENEWABLE CHOW FUSER COATING

Raymond L. Jelfo, Lewisville, Tex.; Stephen Strella, Pittsford, and Willard C. Hamilton, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 12, 1974, Ser. No. 487,937

Int. Cl.² G03G *15/20*

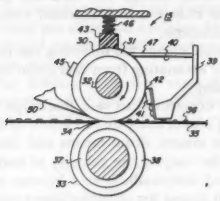
U.S. Cl. 118—60 **6 Claims**

1. Apparatus for fusing toner images to support sheets, said apparatus comprising:

a heated fuser structure including a thermally conductive core;

means for applying a solid low surface energy coating to said core by contacting said core with a bar of low surface energy material, said coating preventing toner from contacting said core;

means for applying a low viscosity release agent to said low surface energy coating for facilitating release of said support sheets from said heated core; and



a deformable backup member forming a nip with said core member through which said support sheets move with said toner images contacting the low viscosity release agent.

3,934,548

BARREL FOR TREATMENT IN DIPPING BATHS, ESPECIALLY A PLATING BARREL

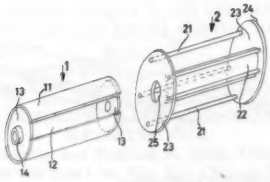
Eduard Kaluza, Im Tuckwinkel, Germany, assignor to Firma Wilhelm Linnhoff OHG, Muhlenweg, Germany

Filed Feb. 18, 1975, Ser. No. 550,718

Claims priority, application Germany, Feb. 15, 1974, 2407209

Int. Cl.² B05C *3/08*

U.S. Cl. 118—418 3 Claims



1. A tumbling drum assembly for treating articles by immersion in a fluid medium comprising:

a horizontally arranged, freely rotatable barrel member having an opening in a side portion thereof, whereby to load and unload the barrel with respect to articles to be treated and fluid treating medium, and disposed within a cage member concentric with said barrel;

a panel forming part of and extending between the ends of said cage;

stop elements disposed on said barrel and associated with said opening on each side thereof;

a drive element disposed on said cage and operatively associated with said stop elements; and

means to reversably rotate said cage; whereby in one direction of cage rotation said panel is carried to a sealing relationship with respect to said opening and simultaneously therewith said drive element engages one of said stop elements and on further rotation in said one direction the barrel is rotated whereby to tumble the barrel contents, and

in a subsequent other direction of cage rotation the panel is removed from opening, the drive element engages the other of said stop elements and the barrel is subsequently rotated in a reverse direction whereby to locate said opening in an unloading position.

3,934,549

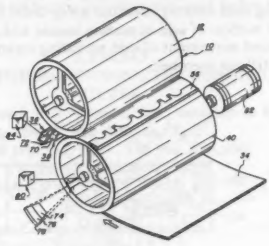
TRANSFER APPARATUS

James R. Davidson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1974, Ser. No. 493,594

Int. Cl.² G03G *15/16*

U.S. Cl. 118—637 8 Claims



1. An apparatus for transferring one component of at least a two component mix from a support surface to a sheet of support material, including:

corona generating means disposed adjacent the support surface for applying an alternating charge potential to the support surface and mix adhering thereto to reduce the attractive force between the mix and the support surface so as to pre-condition the mix thereon;

a transfer member having the sheet of support material secured thereto, said transfer member being positioned closely adjacent to the support surface;

means for applying an electrical biasing potential to said transfer member to attract one component of the preconditioned mix from the support surface to the sheet of support material; and

magnetic means interposed between said corona generating means and said transfer member to remove the other component of the pre-conditioned mix from the support surface so as to prevent the transfer thereof to the sheet of support material.

3,934,550

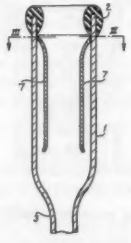
METHOD FOR MACHINE MILKING OF COWS

Hermann Heinrich Karl Worstorff, Tumba, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 14, 1974, Ser. No. 451,280

Int. Cl.² A01J *5/06*

U.S. Cl. 119—14.02 9 Claims

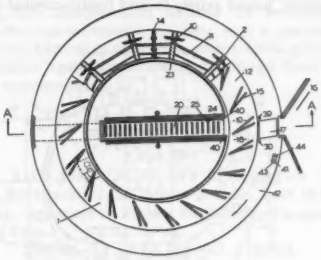


1. A method for machine milking of cows, in which the teats of the udder with their gland openings are subjected continuously to a constant vacuum so as to extract the milk and are subjected to impulses so as to massage the teats, the method being characterized in that the impulses are in at least one of the forms selected from pressure impulses and electric impulses and have a frequency of about 5 Hz to about 50 Hz.

3,934,551
MILKING SYSTEM

Kevin John Sulzberger, 43 R.D., Waitara, Taranaki, New Zealand

Filed Sept. 9, 1974, Ser. No. 504,650
Int. Cl.² A01J 5/00
U.S. Cl. 119—14.04 12 Claims



12. A method of controlling the entrance and departure of cows on to an intermittently rotatable substantially annular milking platform which has means for admitting a cow over the outer periphery of said substantially annular platform while said platform is stationary and means to allow the exit of a milked cow over the inner periphery of said platform whilst the platform is stationary from whence the cow may then pass underneath a portion of said platform, said method including the steps of;

a. providing an automatic advancing control for said rotatable platform so that said rotatable platform is moved from a first stationary position to a second stationary position after the elapsing of a preselected base period which gives at least a minimum period of time sufficient for a cow to clear either periphery of said platform,

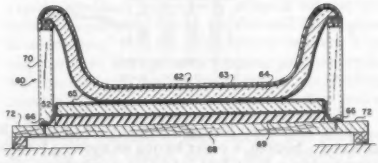
b. providing means for automatically detecting when a cow over said platform is causing an obstruction to rotation of said platform by spanning a periphery thereof and,

c. providing an automatic over-riding control actuable by said means for automatically detecting an obstructing cow which will prevent the automatic advancement of said platform until such time as such an obstruction to rotation of said platform ceases whereupon immediately movement of said platform occurs.

3,934,552
ANIMAL SHELTER WITH PLURAL OPENINGS

Helen C. Kulka, 200 Film Bldg., 2108 Payne Ave., Cleveland, Ohio 44114

Filed July 29, 1974, Ser. No. 492,674
Int. Cl.² A01K 1/02
U.S. Cl. 119—19 5 Claims

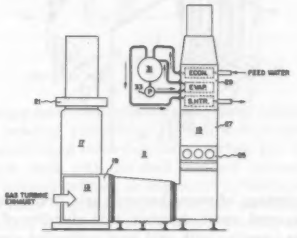


1. An animal shelter suitable for protecting the occupant from loud and/or sudden external noises, comprising a housing member having a solid integral outside surface layer, and contiguous thereto at least one sound absorbing layer and at least one sound barrier layer, said housing member comprising a non-rigid bag-like member having more than one opening and being rigidly attached to a base member a portion of which extends laterally from said housing member to form a threshold entrance area to said housing, and rigidifying means associated with said housing member in the region of at least one of said openings for maintaining such housing member permanently open for entrance to and exit from said shelter, said rigidifying means comprising a rigid frame attached to said base member and extending vertically therefrom for supporting the open end of said bag-like member and holding said member open, said rigid frame defining an opening aligned with said opening in said housing member, said opening in said frame being sufficiently large to permit substantially unrestricted movement of said animal to and from said shelter.

3,934,553
COMBINED WALL BURNER AND FLAMEHOLDER FOR HRSG

James M. Freeman, Jr., West Newbury; Bruce E. Gans, Beverly; Sotiris Lambiris, Andover, all of Mass., and Donald E. Woodmansee, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,952
Int. Cl.² F22B 1/18; F23D 13/24
U.S. Cl. 122—7 B 16 Claims



1. In a heat exchange apparatus of the type including an exhaust gas inlet and an exhaust gas outlet interconnected by a duct; said duct including a boiler tube section for passing a fluid in a non-contact heat exchange relation with the exhaust gas for raising the temperature of said fluid; and, improved combustion means for raising the temperature of said duct exhaust gas upstream from said boiler tube section, the improvement comprising:

a. a plurality of wall burners arranged about the perimeter of said duct; each wall burner including a nozzle portion having an axial centerline directed into said duct;

b. each wall burner having, associated therewith, a flameholder comprising an elongated trough having one end disposed adjacent one duct wall upstream from said burner nozzle portion; and, the other end directed toward an opposite duct wall; each flameholder being approximately parallel to its respective wall burner nozzle axial centerline.

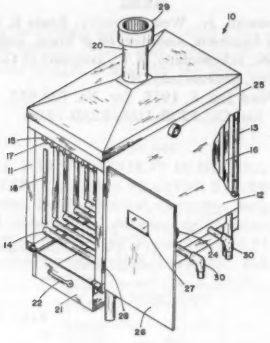
3,934,554
WATER AND ROOM HEATER

Philip E. Carlson, 917 Maple St., Prentice, Wis. 54556

Filed June 3, 1974, Ser. No. 475,610
Int. Cl.² F22B 7/06
U.S. Cl. 122—176 2 Claims

1. An improved water heater and room heater for more efficiently utilizing the combustion heat of cumbustible materials and the like comprising a firebox having a top and a bottom, said firebox including a first metal water chamber, a second metal water chamber, and a third metal water chamber arranged to form U-shaped, vertical walls, said first water chamber, said second water chamber and said third water chamber each having a plurality of solid, metal, elongated,

vertically spaced ribs projecting therefrom and into the firebox for thereby transmitting the heat from the combustion of materials in the firebox to the water located in said first water chamber, said second water chamber and said third water chamber; a plurality of metal grates for supporting the combustible material, said plurality of metal grates connecting said first water chamber to said second water chamber, said plurality of grates providing a first network for passage of water from said first water chamber to said second water chamber, and for extracting heat from the combustion of materials in said firebox; a plurality of heat extracting members located at the top of the firebox, said heat extracting members including a plurality of metal heat extracting pipes having a plurality of radial projecting fins located thereon, said radial fins alternately spaced on said metal heat extracting pipes, said plurality of heat extracting pipes thereby providing a second net-



work for passage of water between said first water chamber and said second water chamber, said plurality of radial projecting fins coacting with said heat extracting pipes to more efficiently extract heat from the combustion of materials in said firebox; said first water chamber, said second water chamber, said third water chamber, said network of grates and said network of heat extracting pipes thereby coacting to provide a firebox that is operable for receiving the heat of combustion from the combustible material from at least five different sides, a cold water inlet located at the bottom of said water chamber and a hot water outlet located at the top of said water chamber, said firebox further including means for receiving the combustion ash, means for allowing the entrance of combustion air, means for controlling the amount of combustion air to the firebox chamber, and means for discharging the combusted gases.

3,934,555

BOILER USING COMBUSTIBLE FLUID

Henri Baumgartner, Bernex, Geneva, and John G. Meier, Geneva, both of Switzerland, assignors to Battelle Memorial Institute, Switzerland

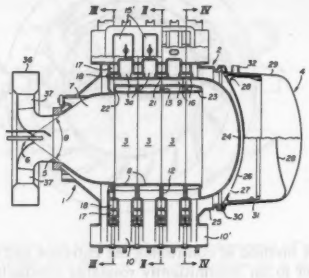
Filed July 3, 1974, Ser. No. 485,623

Claims priority, application Switzerland, July 11, 1973, 10085/73

Int. Cl.² F22B *25/00*

U.S. Cl. 122—225 R **4 Claims**

1. A fluid fuel boiler comprising, a combustion chamber, a cover on said combustion chamber having an opening for introducing a combustion supporting gaseous fluid through said opening, means to impart rotation to the gaseous fluid about an axis of said combustion chamber, a burner for introducing a fluid fuel into the chamber mixed with said gaseous fluid for combustion thereof, said cover having a generally frustro-conical configuration diverging from said opening toward the interior of said chamber at an angle of between 15° and 55°; means defining said combustion chamber having means defining a plurality of axial hot gas flow paths from a downstream portion of said combustion chamber to flow hot gases into an upstream portion of said combustion chamber, and means for diverting some of said hot gas flow along paths in a direction circumferentially of said combustion chamber, said latter paths being immersed in the flow path of said water thereby to improve heat transfer and terminating in a gas outlet, said combustion chamber comprising at least one modular element, joined axially to said frustro-conical cover and



coaxial therewith, said modular element comprising an inner ring and said means defining said plurality of axial hot gas flow paths defining a plurality of axial flow paths disposed circumferentially spaced from each other and radially of each ring thereby radially of said combustion chamber, said modular element comprises said means diverting hot gas flow circumferentially of said combustion chamber, and the last-mentioned means comprising means defining a spiral flow path about each said ring.

3,934,556

BOILER USING COMBUSTIBLE FLUID

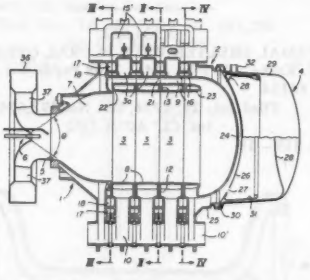
Henri Baumgartner, Bernex, Geneva, Switzerland, assignor to Battelle Memorial Institute, Switzerland

Filed July 3, 1974, Ser. No. 485,638

Claims priority, application Switzerland, July 11, 1973, 10085/73

Int. Cl.² F22B *25/00*

U.S. Cl. 122—225 R **3 Claims**



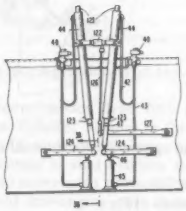
1. A fluid fuel boiler having a combustion chamber having sidwalls and a bottom, a cover having an opening for a burner for introducing a fluid fuel into said combustion chamber, means defining a water circulation circuit surrounding said combustion chamber, means defining an exhaust gas circulation circuit in communication with said combustion chamber and in contact with the water in said water circulation circuit, an annular member disposed defining an annular space around said combustion chamber in communication with said water circulation circuit and forming a part thereof, the im-

provement comprising an expansion vessel connected to said annular member opposed to the bottom of said combustion chamber, said expansion vessel comprising a wall opposed to said bottom and spaced from said bottom defining a space therebetween defining a part of said water circulation chamber and having an opening therein in communication with said water circulation circuit, a flexible diaphragm dividing said expansion vessel into two compartments comprising a water-receiving first compartment defined for receiving water through the last-mentioned opening and a gas-containing second compartment containing a compressible gas opposing water pressure against said flexible diaphragm from water in said first compartment.

3,934,557
LOW FIRE LIGHT-OFF APPARATUS

John W. Dirriwachter, and Robert J. Kelly, both of Richardson, Tex., assignors to Forney Engineering Company, Carrollton, Tex.

Filed Oct. 1, 1974, Ser. No. 510,926
Int. Cl.² F22B *37/42*
U.S. Cl. 122—448 B **6 Claims**



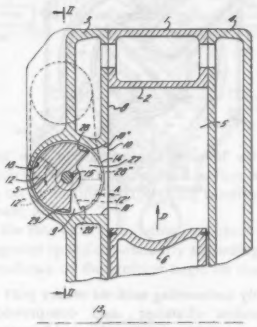
1. Apparatus for controlling a plurality of fuel fired vapor generators for powering a marine propulsion system wherein each vapor generator may be operated in a low fire lightoff mode for ignition and a power mode for driving the propulsion system comprising:

control means operatively coupled to each vapor generator for controlling operation thereof in said respective power and lightoff modes, a regulator responsively coupled to said control means for delivering drive control outputs, a common drive coupled to the regulator and responsive to the drive control outputs, fuel regulator means for each vapor generator responsively coupled to said common drive for delivering fuel to each of said vapor generators in accordance with the drive control outputs, a variable displacement linkage arm coupling said common drive with each of said fuel regulator means, each linkage arm capable of being actuated to respective first and second retracted and extended lengths, and selection means operatively coupled to each linkage arm for selectively actuating each linkage arm to said respective first and second retracted and extended lengths, said selection means responsively coupled to said control means to actuate said linkage arm to said respective first and second retracted and extended lengths in accordance with the respective power and lightoff mode of each of the power generators, whereby each vapor generator may be operated in either mode by the common drive without affecting the operation of the other.

3,934,558
THROTTLING MEANS FOR TROCHOIDAL ROTARY COMBUSTION ENGINES

Gottlieb Wilmers, Neuenstadt, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm and Wankel G.m.b.H., Lindau, Bodensee, both of, Germany

Filed Apr. 2, 1975, Ser. No. 564,364
Claims priority, application Germany, Apr. 19, 1974, 2418852
Int. Cl.² F02B *53/06*
U.S. Cl. 123—8.45 **6 Claims**



1. A rotary internal combustion engine of trochoidal type, having a housing comprising at least one peripheral shell having a multilobed inner peripheral surface and at least two parallel side walls with the shell disposed between the side walls, the housing defining an engine cavity having a longitudinal axis, a rotor rotatably disposed within the cavity and having a generally polygonal profile with a plurality of apex portions which sweep the inner peripheral surface in sealing relation thereto, at least one side wall having in its inner surface an intake port for supplying fresh gas, the port having a greater lengthwise dimension in the direction of rotor rotation than in the radial direction and being opened and closed by a side face of the rotor, wherein the improvement comprises:

a. the side wall having an induction channel therein communicating with the intake port;

b. a rotary valve disposed in the induction channel adjacent to the intake port, the axis of rotation of the valve being disposed perpendicularly to the housing axis and also approximately perpendicularly to the lengthwise dimension of the intake port;

c. the valve cooperating with the upstream edge of the port to form a throttling gap and progressively increasing the cross-section of the open area of the port as the valve turns in the opening direction, and progressively delaying the closing time of the port with increasing valve opening.

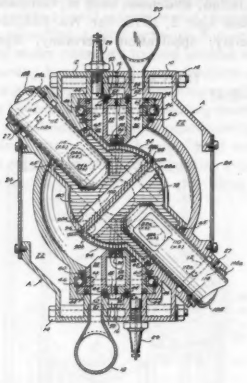
3,934,559
ANTI-POLLUTANT SPHERICAL ROTARY ENGINE WITH AUTOMATIC SUPERCHARGER

William A. Cohen, Brooklyn, N.Y., assignor to Sphero International Company, West Long Branch, N.J.

Filed Mar. 10, 1975, Ser. No. 556,707
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.45 **40 Claims**

1. A rotary engine comprising a casing having a cavity therein, said casing having air intake, fuel inlet and exhaust ports therein communicating with said cavity, an engine shaft rotatably mounted in said casing, a cylindrical member mounted for rotation in said casing, said cylindrical member being directly drivingly connected to said shaft and having a combustion chamber defined in the wall thereof, said combustion chamber registering with said fuel inlet port in at least one

operative position thereof, and said exhaust port in at least one other operative position thereof, and a drive member movably mounted on said cylindrical member to drive same, said cylindrical member, said drive member and the inner wall of said casing defining a compression-expansion chamber,



means operably connecting said air intake port to said compression-expansion chamber, said compression-expansion chamber being operably connected to said combustion chamber and being expandable by the combustion of gases within said combustion chamber to move said drive member.

3,934,560

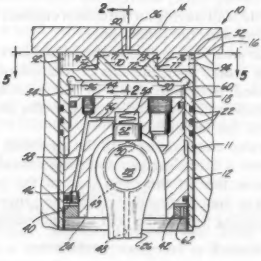
INTEGRATED PRECOMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINES

Joseph L. Dodd, Farmington, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 21, 1974, Ser. No. 444,399

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 B **11 Claims**



11. An internal combustion engine including a piston having first and second parts movable relative to one another in a cylinder in response to reciprocation of the piston with respect to the combustion chamber of an engine whereby said relatively movable parts of said piston comprise a variable compression ratio piston, a cylinder head cooperating with the cylinder and the first and second parts of said piston to define the combustion chamber, the improvement comprising a first projection means extending from said second part of said piston into the combustion chamber;

a second projection means extending from a cylinder head into the combustion chamber closely adjacent to said first projection means;

said first projection means extending from the said second part of said piston and said second projection means extending from the cylinder cooperating to define at least one precombustion chamber and at least one secondary combustion chamber interior to the combustion chamber; and

at least one aperture for providing communication between the precombustion chamber and the secondary combustion chamber.

3,934,561

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH COMBINED FUEL PUMP CONTROL SWITCH

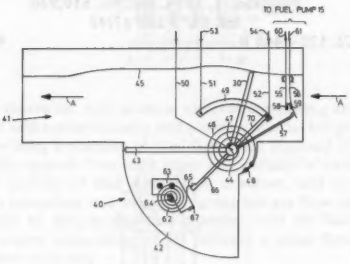
Peter Romann, Stuttgart, and Erwin Nägele, Hessigheim, both of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Oct. 4, 1974, Ser. No. 512,210

Claims priority, application Germany, Nov. 16, 1973, 2357262

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EA **7 Claims**



1. Fuel injection system for an internal combustion engine (**10**) comprising

a source of fuel (T);

a fuel supply pump (**15**);

electromagnetically operated fuel valve means (**11**) hydraulically connected to receive pressurized fuel from said fuel supply pump (**15**);

electrical pulse generating means (TS, **22**) connected to the injection vlave means (**11**) for controlling the operating time (Ti) thereof and hence, for controlling the amount of fuel injected during such opening time;

and air quantity sensing means (LM) located in the induction pipe (**25, 41**) of the engine, connected to and providing an electrical control signal to said pulse generating means for controlling the pulse duration thereof in accordance with air flow through the induction pipe, said sensing means including a deflection member (**30**) located in the path of air flow through the induction pipe and means (**46**) acting on the deflection member for providing a reset force against deflection of the deflection member under air flow conditions,

switch means (**55, 56; 58, 59**) and a switch operating means (**57**) connected to said flap or disk (**30**), said switch means being located with respect to said switch operating means to be opened when the flap or disk (**30**) is at rest position and to be closed when the deflection member (30) moves away from rest position, said switch means being connected to the fuel supply pump (**15**) for de-energizing the fuel supply pump when the engine does not require fuel, as sensed by absence of air flow in the induction pipe; and

auxiliary force means (**62**) acting on the deflection member in a limited range of deflection from rest to open position and tending to decrease said reset force when the deflection member is at, or close to rest position,

said auxiliary force means being operable for decreasing the reset force to permit movement of said deflection mem-

ber away from rest position and hence reliable closing of the switch upon small air flow conditions in the induction pipe and for preventing the overriding of the deflection force of said small air flow by the reset force.

3,934,562

TWO-CYCLE ENGINE

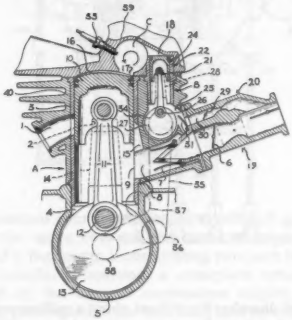
Yoshiharu Isaka, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sept. 23, 1974, Ser. No. 508,523

Claims priority, application Japan, Sept. 26, 1973, 48-108191; Dec. 11, 1973, 48-137988

Int. Cl.² F02B *25/12*

U.S. Cl. 123—53 BA **18 Claims**



1. A crankcase precompression type two-cycle engine system comprising:

a crankcase precompression type first two-cycle engine including a first cylinder having, in the wall thereof, an exhaust port and at least one scavenging port, a first piston reciprocating in said cylinder to open and close said exhaust and scavenging ports, a first crankcase connected with said scavenging port through at least one scavenging passage and an intake passage to supply air or lean air-fuel mixture to said first crankcase;

a crankcase precompression type second two-cycle engine, including a second cylinder mounted substantially in parallel with the first cylinder and having, in the wall thereof, at least one second scavenging port, a second piston reciprocating in said second cylinder to open and close said scavenging port therein, a second crankcase connected with said scavenging port in said second engine through at least one second scavenging passage, and a second intake passage to supply a rich air-fuel mixture to said second crankcase, said second piston being cooperatively coupled to said first piston so that said pistons move approximately at the same timing; and

a combustion chamber provided with an ignition plug and positioned between the first and second engines, interconnecting the cylinders of said engines.

3,934,563

SPEED-DEPENDENT IGNITION ANGLE CONTROL

Rudolf Müller, Hannover-Stocken, and Jürgen Decker, Berenbostel, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

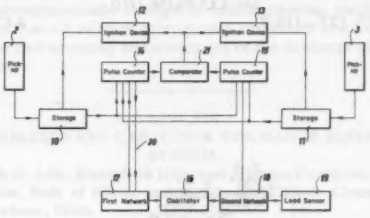
Filed May 10, 1974, Ser. No. 469,007

Claims priority, application Germany, May 19, 1973, 2325479

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **18 Claims**

1. In a method for speed-dependent control of the ignition angle of an internal combustion engine with external ignition, wherein an integrator for accumulating an electric quantity is controlled within a predetermined interval by an electric signal produced by markings on a rotating element of the engine and receiving elements associated with such markings, and from the integration result present at the end of the interval there is obtained an accurately timed ignition signal, the improvement comprising:



determining said predetermined interval with a constant angle interval extending between a first and a second marking on an engine part rotating relatively to another engine part; and

modifying the rate of accumulating said electric quantity in said integrator speed-dependently according to a non-linear dependence of the ignition angle on the speed.

3,934,564

CONTROL VALVE FOR EXHAUST GAS RECYCLING APPARATUS

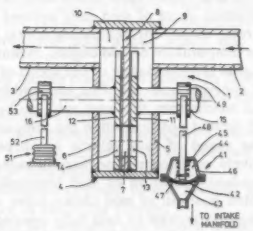
Konrad Barnert, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 28, 1973, Ser. No. 429,625

Claims priority, application Germany, Jan. 22, 1973, 2303007

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **2 Claims**

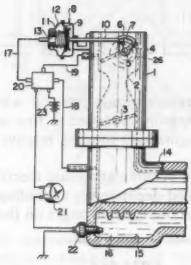


1. In apparatus for recycling exhaust gas and including two devices for converting operating parameters of an internal combustion engine into mechanical regulating movement, the improvement of a valve for controlling the quantity of exhaust gas recycled comprising a housing having an inlet and an outlet for the exhaust gas and a stationary partition disposed between the inlet and the outlet and dividing the housing into two chambers, said partition having an opening therethrough for the passage of exhaust gas; two perforated plate members, each disposed in one of said chambers between said partition and the inlet and the outlet, respectively; and two rotatable axles, each axle mounting a different one of said two perforated members such that a hole in the respective perforated member can be moved into and out of alignment with said opening in said partition thereby to open and close said opening and control a flow of exhaust gas through the valve, each of the axles being adapted for coupling to a different one of the converting devices of the recycling apparatus.

3,934,565
CHOKE CONTROL SYSTEM FOR CARBURETORS

Hirohumi Matsumoto, and Masahiko Nakada, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 10, 1974, Ser. No. 477,979
Claims priority, application Japan, June 22, 1973, 48-69743
Int. Cl.² F02M 1/10
U.S. Cl. 123—119 F 8 Claims



1. An automatic choke system for an automotive vehicle internal combustion engine comprising a choke valve operable between a fully opened and a fully closed postion, temperature sensitive bimetallic spring means for controlling opening and closing of said choke valve, a choke control mechanism adapted to move said choke valve in the direction of opening to a limited position short of said fully opened position but proximate thereto, means for generating a first signal representative of the temperature of said engine, means for generating a second signal representative of the speed of said vehicle, and means for applying both said first and said second signals to said control mechanism to cause said choke valve to be opened to said limited position when the temperature of said engine and the speed of said vehicle reach predetermined levels, respectively, said control mechanism being arranged to permit independent operation of said bimetallic means beyond said limited position of said choke valve whereby said choke valve may be moved to said fully opened position by said bimetallic means when said engine has reached a fully warmed-up condition.

3,934,566
COMBUSTION IN AN INTERNAL COMBUSTION ENGINE

Michael A. V. Ward, 205 Walden St., Apt. 5-D, Cambridge, Mass. 02140

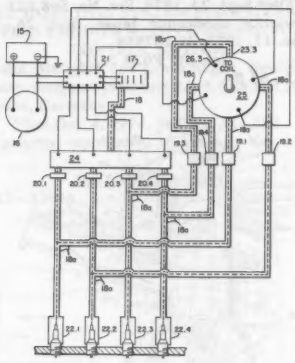
Filed Aug. 12, 1974, Ser. No. 496,393
Int. Cl.² F02P 1/00; F02B 33/00; H05B 9/06; F23N 5/20
U.S. Cl. 123—119 E 25 Claims

1. A system for use with an internal combustion engine having a combustion chamber, means for producing a combustible mixture therein, and means for igniting said mixture, the system comprising

means for generating electromagnetic energy at an operating frequency, f_o, of the order of the plasma frequency, f_{ps}, of a species, s, of charged particles of said mixture where

$$f_{ps} = \frac{1}{2\pi}\sqrt{\frac{n_s e^2}{m_s \epsilon_o}},$$

and where n_s is the species number density of the mixture, m_s is the species mass, e is the charge of an electron, and ϵ_o is the dielectric constant of free space, and for conducting said

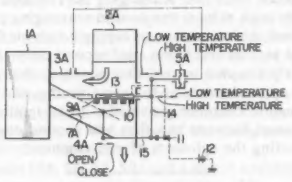


energy to said chamber for at least about a millisecond following ignition of said mixture to couple said energy to charged particles of said species in said mixture during combustion thereof.

3,934,567
FUEL EVAPORATING DEVICE

Mamoru Fujieda, Ibaraki; Teruo Yamauchi, Hitachi[1] and Masakichi Momono, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 27, 1974, Ser. No. 455,407
Claims priority, application Japan, Mar. 28, 1973, 48-34589
Int. Cl.² F02M 31/00
U.S. Cl. 123—122 H 6 Claims

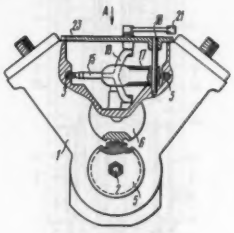


1. A fuel evaporating device comprising heating means provided in an air intake pipe of an internal combustion engine and arranged such that the fuel contacts a surface of said heating means; means located in the vicinity of said heating means for detecting the temperature of said heating means and maintaining the temperature of said heating means substantially constant; means for detecting the negative suction pressure of the internal combustion engine; and means for varying the temperature at which said heating means is set in relation to the output of said negative suction pressure detecting means, whereby the temperature at which said heating means is set is lowered as the negative suction pressure rises.

3,934,568
CRANKSHAFT GOVERNOR OF AN INTERNAL COMBUSTION ENGINE

Leonid Mikhailovich Malyshev, ulitsa Belinskogo, 28, kv. 30; Lev Iosifovich Indrupsky, ulitsa Avtozavodskaya, 69, kv. 13; Boris Pavlovich Gusev, ulitsa Eleny Kolesovoi, 68, kv. 98, and Yakov Borisovich Pisman, ulitsa Volodarskogo, 105, kv. 36, all of Yaroslavl, U.S.S.R.

Filed July 23, 1974, Ser. No. 491,053
Int. Cl.² F02D 1/04
U.S. Cl. 123—140 R 1 Claim

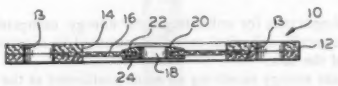


1. An internal combustion engine crankshaft governor disposed in the space between the banks of angularly related sections of a fuel pump incorporating two rack bars controlling fuel supply, comprising: a crosspiece rotated by said crankshaft of the internal combustion engine; centrifugal flyweights; pivot spindles for mounting said flyweights on said crosspiece; a coupling for converting the rotary movement of said centrifugal flyweights to the translatory movement of said two rack bars of said fuel pump controlling fuel supply; a double-arm lever actuated by said centrifugal flyweights through said coupling and having one arm connected with one of said rack bars of said fuel pump; a pivot spindle secured in the housing of said pump and positioned normally to the plane passing through the longitudinal axes of said rack bars, said pivot spindle carrying said lever rotatably mounted thereon; a spring for balancing the effort of said lever having one end connected with the other arm of said lever; a control lever for adjusting the tension of said spring connected with the other end of said spring; one more pivot spindle secured in the housing of said pump, positioned normally to the plane passing through the longitudinal axes of said rack bars and carrying said control lever rotatably mounted thereon.

3,934,569
APPARATUS AND METHOD FOR ATOMIZING FUEL-AIR MIXTURE IN A CARBURETION SYSTEM

Robert F. Bobene, Morton Grove, Ill., assignor to Compression Dynamics, Incorporated, Skokie, Ill.

Continuation-in-part of Ser. No. 383,378, July 27, 1973, abandoned. This application Apr. 4, 1974, Ser. No. 457,700
Int. Cl.² F02M 29/00
U.S. Cl. 123—141 11 Claims

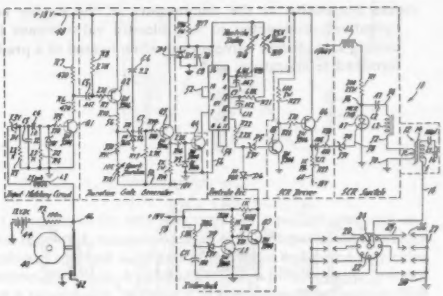


1. In an apparatus for atomizing a fuel-air mixture in an internal combustion engine having a a carburetor and an intake manifold, a passageway between said carburetor and said intake manifold for the flow of said fuel-air mixture therethrough, an atomizing member disposed generally transversely of said passageway, and laterally disposed aerodynamically configured means having an opening therethrough and completely supported by a foraminous member located in said passageway for creating a funnel-type flow pattern of said fuel-air mixture through said atomizing member in said passageway, said dynamically configured means forming a reinforced rim around the circumference of said opening and having one side facing opposite the direction of flow of said fuel air mixture through said passageway, said one side having substantially a curved aerodynamically curved configuration, said aerodynamically configured means allowing maximum flow of fuel-air mixture through said carburetor resulting in greater fuel economy and abatement of the discharge of pollutants.

3,934,570
FERRORESONANT CAPACITOR DISCHARGE IGNITION SYSTEM

Joseph R. Asik, Bloomfield Hills, and Mitsugu Hanabusa, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 24, 1974, Ser. No. 463,919
Int. Cl.² F02P 3/02
U.S. Cl. 123—148 E 8 Claims



1. In combination with an internal combustion engine, a capacitor discharge ignition system which comprises:
an ignition coil having primary and secondary windings and a ferromagnetic core about which said windings are wound;
a spark plug having electrodes spaced to form a spark gap, one of said electrodes being coupled to one terminal of said secondary winding;
a first capacitor connected in series with said spark gap, one terminal of said capacitor being coupled to the other terminal of said secondary winding;
a second capacitor coupled to said primary winding;
a DC source of electrical energy;
circuit means for charging said second capacitor from said DC source of electrical energy and for discharging said second capacitor through said primary winding in timed relation to operation of said engine; and
said second capacitor when discharged through said primary winding producing ferroresonant oscillations in the secondary circuit of said ignition coil.

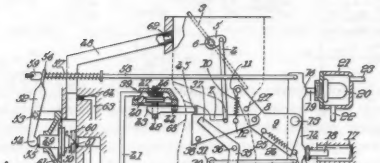
3,934,571
CARBURETORS FOR INTERNAL COMBUSTION ENGINES, WITH AN AUXILIARY STARTING DEVICE

Francois Mennesson, Nanterre, France, assignor to Societe Industrielle de Brevets et d'Etudes, Neuilly-sur-Seine, France

Filed Mar. 30, 1973, Ser. No. 346,477
Claims priority, application France, Apr. 10, 1972, 72.12543
Int. Cl.² F02M 1/16
U.S. Cl. 123—179 G 5 Claims

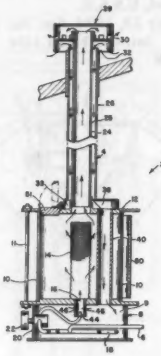
1. Carburetor for an internal combustion engine, comprising:

an intake pipe;
an operator actuatable main throttle member in said pipe;
a main fuel jetting system which opens into said pipe upstream of said throttle member for providing fuel to the engine during operation thereof under load;
and an auxiliary cold starting and warm-up device responsive to the temperature of the engine to increase the flow rates of fuel and air delivered to the intake pipe, said auxiliary device including:
an unbalanced startng valve located in the intake pipe upstream of the outlet of said main fuel jetting system into said pipe;
resilient return means urging the starting valve towards its closed position and exerting a force which decreases in proportion to engine temperature as the temperature of the engine increases;
a passage which opens into said intake pipe downstream of the main throttle member;
closure valve means in said passage;
means for delivering a mixture of air from a zone of said intake pipe downstream of the starting valve and of fuel, having a predetermined richness, to said passage upstream of said closure valve means;
means responsive to the temperature of the engine and operatively connected to said closure valve means for closing said closure valve means when heated to a predetermined temperature; and



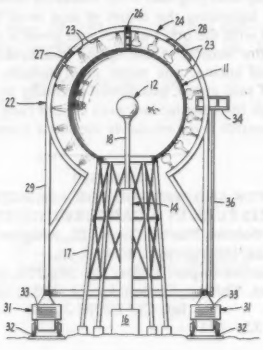
means responsive to the pressure existing in the intake pipe downstream of the main throttle member and limiting closure of said starting valve at small engine load whereby the air-fuel mixture is prevented from being substantially enriched,
wherein said limiting means are sensitive to pressure existing in the intake pipe downstream of the main throttle member to prevent said starting valve from closing beyond an intermediate degree of opening as soon as the engine is self running after starting, said pressure sensitive means cooperating with said temperature responsive means, whereby the minimal degree of opening is increased in proportion to engine temperature as the temperature of the engine increases; and
wherein said resilient means are constituted by a first spring mounted between a first lever rotatable about a fixed axis and a second lever rotatable on an axle carried by the first lever, the return force exerted by said first spring being transmitted to the starting valve through a link rod coupled to the second lever towards the center of the second lever, while one of the ends of the second lever carries the abovementioned axle and the other end cooperates with stop means controlled by said pressure sensitive means, the angular position of the first lever being determined by the temperature responsive means.

3,934,572
INFRARED SPACE HEATER
Walter Dorwin Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960
Filed Apr. 2, 1973, Ser. No. 347,220
Int. Cl.² F24C 3/04
U.S. Cl. 126—92 B **17 Claims**



2. A space heater as described in claim **1** wherein said chimney and said burner are cylindrical and are positioned with substantially concentric vertical axes.

3,934,573
SPHERICAL SYSTEM FOR THE CONCENTRATION AND EXTRACTION OF SOLAR ENERGY
Alessandro O. Dandini, 101 Greenridge Drive, Reno, Nev. 89502
Filed Feb. 28, 1975, Ser. No. 554,194
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 **14 Claims**

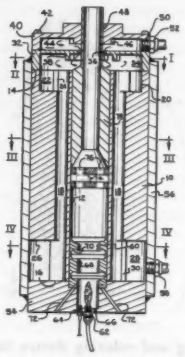


1. Apparatus for collecting solar energy, comprising
a generally spherical member mounted to receive the rays of the sun,
a heat energy receiving element positioned at the center of said spherical member,
a plurality of lenses in said spherical member formed for concentrating and directing heat energy radiation impinging said spherical member onto said heat energy receiving element,
and means connected to said heat energy receiving element for receiving heat energy therefrom and adapted for connection to equipment for utilizing such heat energy to perform work.

3,934,574
HEAT EXCHANGER

Howard R. Johnson, Grass Lake, Mich., assignor to Hush Company, Inc., Ann Arbor, Mich.

Filed Jan. 10, 1974, Ser. No. 432,199
Int. Cl.² F24H 1/00
U.S. Cl. 126—350 9 Claims



1. A heat exchanger characterized by its high heat exchanging capabilities in a concise configuration comprising, in combination, an elongated heat conducting core having first and second end regions, a plurality of passages defined in said core extending between said end regions, said passages each having first and second end regions, respectively, heat exchanging supply means associated with said core controlling the temperature thereof, a first chamber communicating with said core first end region and said passages' first ends, a second chamber communicating with said core second end region and said passages' second ends, inlet fluid heat transfer means communicating with said first chamber, outlet fluid heat transfer means communicating with said second chamber, and fluid flow control means introducing a fluid heat transfer medium into said passages' first end in a spiraling manner to effectively transfer heat between said core and the medium within said passages, said fluid flow control means including elongated inlet ports defined in said core having a length parallel to the length of said core and communicating with said first chamber and intersecting said passages' first ends in a substantially tangential manner.

3,934,575
TAMPON DEVICE TO TEST FOR MICRO-ORGANISMS

Louis Bucalo, 155 Roberts St., New York, N.Y. 11741

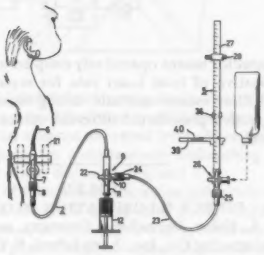
Division of Ser. No. 329,862, Feb. 5, 1973, Pat. No. 3,842,166.
This application Aug. 23, 1974, Ser. No. 499,925
Int. Cl.² A61B 10/00
U.S. Cl. 128—2 W 5 Claims

1. For use in testing for the presence of micro-organisms, a tampon of a type which could be inserted into the vagina during the menstrual cycle, and at least one device embedded within and surrounded by the tampon, said device including a culture medium for promoting the growth of micro-organisms and a carrier means carrying the culture medium and rendering the latter accessible to fluids absorbed by the tampon for growing in the culture medium micro-organisms present in the fluids.

3,934,576
CENTRAL VENOUS CATHETER SYSTEM

Curt Aslov Danielsson, Borlange, Sweden, assignor to AB Sundsvalls Specialprodukter, Sundsvall, Sweden

Filed Nov. 14, 1973, Ser. No. 415,753
Claims priority, application Sweden, Nov. 17, 1972, 14941/72
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 D 6 Claims



1. Apparatus for safe puncturing of a central vein such as a vena subclavia, comprising: a flexible catheter of thin material having at one end a tip and at the other end a one-way valve connected thereto, a flexible extension tube having a first end and a second end, the first end thereof sealingly connectible to the other end of the catheter and the one-way valve, a multiway-valve connected to the second end of the flexible tube and including connections for venous pressure, injection syringe means and dropping supply means,

a retractable cannula connectible to the other end of the catheter through the one-way valve in lieu of said extension tube and capable of extending through the one-way valve and the catheter and having a tip portion for projecting from the tip of the catheter, and a venous pressure meter connected to the venous pressure connection of said multiway-valve.

3,934,577
FETAL HEART RATE MONITORING APPARATUS

Edward Paul Romani, Holland, Pa., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 313,373, Dec. 8, 1972, abandoned.
This application Aug. 9, 1974, Ser. No. 496,247
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 T 5 Claims

1. In apparatus for monitoring heart beat activity in which means are provided for obtaining electrical Doppler signals from ultrasonic Doppler shifted information derived from heartbeat motion, the arrangement comprising:

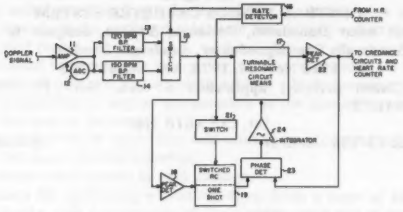
filter means for passing a first band of frequencies including selectively actuable means for passing a second band of frequencies in lieu of the first band, of said electrical Doppler signals;

tunable resonant circuit means for de-emphasizing in the passed band of frequencies, frequency content other than that closely about the resonant circuit frequency for providing an output signal indicative of fetal heart rate;

phase detector means responsive to a phase shift between input signals to and output signals from the resonant

circuit means, for tuning the resonant circuit means at a preselected rate in accordance with the detected phase shift;

timing means defining a first pulse period in response to said input signals and defining a second pulse period in lieu of the first, for inhibiting the response of said phase detector means during the pulse period defined; and



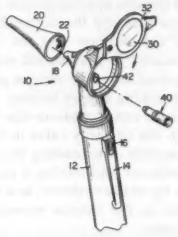
rate detector means operatively coupled to the output signal indicative of fetal heart rate for separately controlling said filter means and said timing means in response to respective preselected different values of the heart rate signal.

3,934,578

DIRECT ILLUMINATION OTOSCOPE

Helmut A. Heine, Herrsching, Germany, assignor to Propper Manufacturing Co., Inc., Long Island, N.Y. and Optotechnik Heine KG, Herrsching, Germany, part interest to each

Filed May 28, 1974, Ser. No. 473,499
Int. Cl.² A61B 1/06
U.S. Cl. 128—9 **1 Claim**



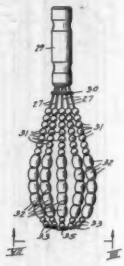
1. An otoscope comprising an otoscope speculum, a bulb sleeve within said otoscope speculum, movable contact means protruding into said sleeve, and an illumination bulb received within said sleeve from the proximal end thereof, said illumination bulb including a bulb chassis, an evacuated envelope at the forward end of said bulb chassis dimensioned to be received within said sleeve, filament contact legs extending rearwardly from said evacuated envelope into said bulb chassis, an electrically conductive first contact ring positioned over said bulb chassis, an electrically conductive second contact ring positioned over said bulb chassis, electrical insulating means intermediate said first and second electrical contact rings, one of said filament contact legs being in engagement with said first contact ring, the other said filament contact leg being in engagement with said second contact ring, said second ring being in electrical contact with said sleeve, said first contact ring having an exterior diameter smaller than the exterior diameter of said second contact ring and being in engagement with said movable contact means, such that engagement of said movable contact means with said first contact ring completes an electrical circuit to the bulb and positively retains said bulb in said sleeve.

3,934,579

MASSAGING AND RELAXING DEVICE

Brunhilde Brodbeck, 1440 Poplar Ave., Memphis, Tenn. 38104

Filed Oct. 4, 1974, Ser. No. 511,981
Int. Cl.² A61H 15/00
U.S. Cl. 128—57 **2 Claims**



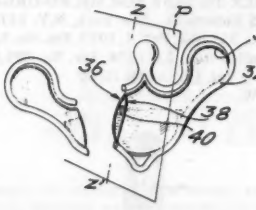
1. A massaging and relaxing device for stimulating and relaxing various parts of the body having at least one hand grip and a plurality of beads extending from said hand grip, yieldable mounting means freely and flexibly mounting said beads for rotatable movement with respect to each other for contact with the body, comprising a series of flaring wires flaring outwardly from one end of said hand grip and converging toward their outer ends and turned inwardly as they approach their outer ends, and terminating at their outer ends at a relatively small diameter disk generally coaxial with said hand grip and connected to said disk in equally spaced radial relation with respect to each other, and said wires each having said beads freely mounted thereon and extending along greater portions of the length thereof.

3,934,580

CHEMICALLY ACTING INTRA-UTERINE DEVICE

Rene Cournut, Bordeaux-Cauderan, France, assignor to Apamed Anstalt, Vaduz, Liechtenstein

Filed Nov. 11, 1974, Ser. No. 522,966
Claims priority, application France, Nov. 9, 1973, 73.40003
Int. Cl.² A61F 5/46; A61M 31/00
U.S. Cl. 128—130 **14 Claims**



1. An active intra-uterine device comprising a hydrophobic substrate of high mechanical resiliency, wherein said substrate comprises, within the volume thereof, inclusions of polymerized hydrophilic substances grafted on said hydrophobic substrate and cross-linked, in which water-soluble chemical agents have been stored previously, said hydrophobic substrate being porous so that said agents may perfuse through said hydrophobic substrate when the latter is placed in an aqueous medium.

3,934,581

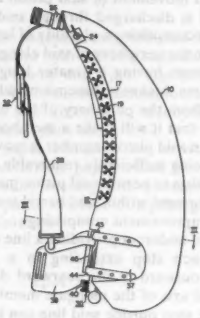
BREATHING APPARATUS

Wilbur J. O'Neill, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 832,669, June 12, 1969, abandoned. This application Sept. 3, 1971, Ser. No. 177,859

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—142 17 Claims



1. Underwater breathing apparatus, comprising:

A. a relatively hard inflexible outer protective shell;

B. a relatively soft flexible body-conforming undersurface for placement on a diver's back and connected to said shell;

C. breathing bag means positioned between said undersurface and said shell;

D. means for admitting a breathable gas to said breathing bag means;

E. means for communicating said breathing bag means with the diver;

F. said apparatus being constructed and arranged that said breathing bag means is freely movable in the area between said undersurface and said shell when communicative with the diver and when supplied with said breathing gas; and

G. support means for supporting said apparatus on the diver.

3,934,582

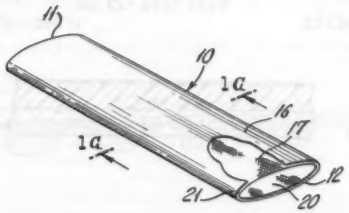
SURGICAL WRAP

Thomas M. Gorrie, Kendall Park, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 2, 1974, Ser. No. 430,264

Int. Cl. A61f *13/00*

U.S. Cl. 128—157 8 Claims



1. Surgical draping means for providing ease of aseptic application and close fit of a surgical drape to a body extremity, said draping means comprising a sterile, elongated tubular wrap, closed at one end and open at the other end, and having substantially coextensive inner and outer layers, said inner layer comprising a stretchable, textile material with good slip-over properties, and said outer layer comprising a thin, fluid impervious, elastic drapable material which is a barrier to bacterial migration and meets the antistatic properties required for operating rooms.

3,934,583

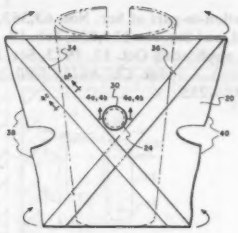
THERAPEUTIC MUSCULOSKELETAL SUPPORT SLEEVE AND METHOD OF MANUFACTURING SAME

Donald W. Hollingshead, and Cecil E. Phillips, both of Eugene, Oreg., assignors to Danny W. Hollingshead, Eugene, Oreg.

Filed Sept. 27, 1974, Ser. No. 509,821

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—165 10 Claims



1. A musculoskeletal shin support device comprising:

a. an elongate form-fitted sleeve of elastic, heat-retaining foam material adapted to extend from above the ankle to below the knee for compressively ensheathing the area around and about the lower leg; and

b. a plurality of elongate elastic strips adhesively attached in a relaxed condition along their entire lengths to the interior surface of said sleeve and spaced substantially anterior and parallel to the longitudinal axis of said sleeve in positions so that, when said sleeve is fitted in place about the lower leg, the elastic strips will not resist movement, but will increase the compressive force of the sleeve and press the anterior muscles of the lower leg against the tibia.

3,934,584

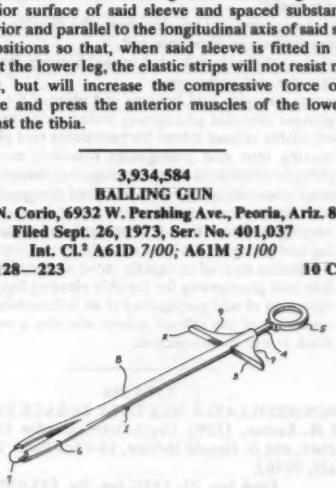
BALLING GUN

Nicholas N. Corio, 6932 W. Pershing Ave., Peoria, Ariz. 85345

Filed Sept. 26, 1973, Ser. No. 401,037

Int. Cl.[2] A61D *7/00*; A61M *31/00*

U.S. Cl. 128—223 10 Claims



1. A balling gun for administering a bolus within the throat of an animal, said balling gun comprising:

a. an elongated barrel having a plurality of resilient arms disposed at one end thereof for grasping the bolus;

b. said arms having inner surfaces which define a space within said gun to receive a bolus through an opening located at the end of the arms,

c. a plunger extending through the other end of said barrel and slidably mounted for axial movement within said barrel with one end extending within the space defined by said arms;

d. expansion means located within said space and secured to said plunger for engagement with a portion of said inner surfaces extending directly from said one end of the barrel with said portion being inclined with respect to the longitudinal axis and toward said other end of the barrel,

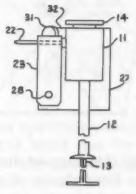
e. said expansion means being effective to radially expand said arms in response to axial movement of said plunger toward said other end.

3,934,585

METHOD AND APPARATUS FOR APPLICATION OF EYE DROPS

David M. Maurice, 148 Tuscaloosa Ave., Atherton, Calif. 94025

Continuation-in-part of Ser. Nos. 63,363, Aug. 13, 1970, abandoned, and Ser. No. 114,133, Feb. 10, 1971, abandoned.
This application Oct. 12, 1973, Ser. No. 405,786
Int. Cl.² A61M *3/00*
U.S. Cl. 128—225 14 Claims



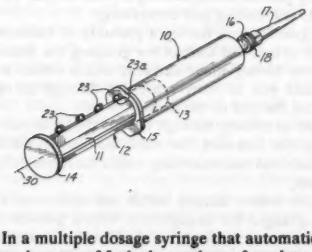
1. An eye drop dispenser comprising:
housing means defining a small passageway terminating in a nozzle and adapted to contain an eye drop liquid to be dispensed,
means engaging said housing means for directing said nozzle toward an eye to be injected,
a plunger slideably mounted in said housing for movement into the said passageway,
a spring engaging said housing and plunger for urging said plunger into said passageway under spring pressure, and
controllable release means for restraining said plunger from moving into said passageway rotatably mounting said plunger relative to said housing and including visually obstructed engaging surfaces of said plunger and housing with each of said surfaces having at least one abruptly varying contour about said plunger and means for rotating said plunger to release said plunger at least once each revolution thereof to rapidly move under spring pressure into said passageway for forcibly ejecting liquid from the open end of said passageway at an indeterminate point of operation of the release means whereby a user does not blink at eye drop injection.

3,934,586

NON-REFILLABLE MULTIPLE DOSAGE SYRINGE

Fred H. Easton, 11591 Capri Drive, Garden Grove, Calif. 92641, and N. Donald Helmer, 10-63rd Place, Long Beach, Calif. 90803

Filed Jan. 22, 1975, Ser. No. 543,030
Int. Cl.² A61M *1/00*
U.S. Cl. 128—235 5 Claims



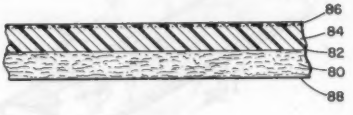
1. In a multiple dosage syringe that automatically signals to the user's sense of feel when a dose of predetermined volume has been discharged therefrom, including: an elongate hollow barrel capable of holding a charge comprising a plurality of such doses of a liquid material; discharge means mounted on the forward end of said barrel through which each of said doses can be discharged from said barrel; a piston slidably mounted within said barrel; an elongate piston member having a central axis, affixed to said piston and extending rearwardly through the rear end of said barrel; and stop means operatively associated with said barrel and member that tend to restrict forward movement of said piston after a dose of said liquid material is discharged through said discharge means, and stop means comprising a plurality of longitudinally spaced stops formed on the periphery of said elongate piston member, each of said stops having a greater longitudinal dimension than its transverse thickness dimension and each stop protruding outwardly from the periphery of the elongate member to such an extent that it will strike a member at the rear end of said barrel when said piston member is moved forwardly, each of said stops being sufficiently removable from its outwardly projecting position to permit said piston member and piston to move further forward within said barrel toward said discharge member; the improvement comprising:
a longitudinal undercut providing a line of maximum weakness of each stop extending in a longitudinal plane obliquely outward in the rearward direction relative to the central axis of the elongate member so that the portion of the stop outside said line can be broken off, leaving an inner portion of the stop protruding somewhat outside the elongate member, the amount of the protrusion of said inner portion being sufficiently slight so that the protrusion can move through the barrel in the direction, the rear end of the protrusion having an edge which scores the inner wall of the barrel during movement of the piston member sufficiently to prevent a sufficient seal between the piston and the barrel wall to permit discharging accurate quantitative doses from a fresh charge of liquid material after the original charge has been discharged.

3,934,587

DISPOSABLE ARTICLES HAVING A WATER-PERMEABLE AND WATER-REPELLENT SURFACE

Roy Gerald Gordon, 22 Highland St., Cambridge, Mass. 02138

Filed June 17, 1974, Ser. No. 479,636
Int. Cl.² A61F *13/16*; B32B *27/42*
U.S. Cl. 128—284 10 Claims



1. An article of manufacture comprising a thin sheet, one side of said sheet being water-permeable and the other side being water-repellent, wherein said water-permeable side comprises a polymeric compound having a molecular weight in excess of about 1000 and having free hydrophilic groups selected from hydroxyl and amine groups and said water-repellent side comprises the reaction product of said polymeric compound with a vapor phase mixture comprising acid chloride having the general formula

and aldehyde having the general formula

wherein R_1 and R_2 are independently selected from straight or branched-chain aliphatic hydrocarbon radicals having from 1 to about 20 carbon atoms and cyclic hydrocarbon radicals having from 6 to about 20 carbon atoms, further wherein the molar proportion of acid chloride to aldehyde in the vapor phase mixture is greater than about 1:10.

7. A disposable paper container for containing aqueous liquids comprising cellulosic paper which has been exposed along the side normally coming into contact with aqueous liquids to a vapor phase mixture comprising acid chloride having the general formula

and aldehyde having the general formula

wherein R_1 and R_2 are independently selected from straight or branched-chain aliphatic hydrocarbon radicals having from 1 to about 20 carbon atoms and cyclic hydrocarbon radicals having from 6 to about 20 carbon atoms, further wherein the molar proportion of acid chloride to aldehyde in the vapor phase mixture is greater than about 1:10.

10. A disposable article of sanitary clothing according to claim 9 wherein said article is suitable for use as a diaper.

3,934,588

DISPOSABLE DIAPER HAVING FACING LAYER WITH PATTERNED PREFERENTIAL FLOW AREAS

Frederick K. Mesek, Downers Grove; Virginia L. Repke, Oak Forest, and William R. Strickel, Chicago, all of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 20, 1974, Ser. No. 498,891
Int. Cl.² A61F *13/16*
U.S. Cl. 128—290 W **22 Claims**

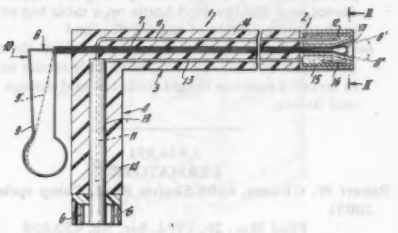
1. A multi-layer diaper comprising: a porous, imperforate facing layer in the form of a non-woven fabric formed of long fibers and short fibers, said facing layer having separate and discrete areas of preferential liquid flow throughout at least the central portion of its areas arranged sufficiently closely to each other so that no point in the central portion of the facing layer is more than one inch away from an area of preferential liquid flow; a highly porous, loosely compacted, cellulosic fibrous batt in face-to-face juxtaposition with the inner face of said facing layer; and a water-impervious backing sheet adhered to the outer surface of said batt.

3,934,589

SURGICAL INSTRUMENT FOR STERILIZING WOMEN BY LIGATURE OF TUBES

Hildebrand Zimmer, Ahrensburg, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed May 24, 1974, Ser. No. 473,220
Claims priority, application Germany, May 26, 1973, 2326988
Int. Cl.² A61B *17/36, 17/28*
U.S. Cl. 128—303.1 **6 Claims**



1. A surgical instrument for sterilizing women by necrosis of tubes, comprising a tubular probe having a bore therethrough and an enlarged cavity at a distal end thereof, tongs extending through the bore with a gripper jaw extending out the distal end of the cavity for engaging the tubes and being retractable into the enlarged end of the bore after it is engaged with the tubes, said tongs having an operating handle exteriorly of the probe for shifting the tongs in the bore and for operating the jaws of said tongs, means for directing a coolant to said probe around said gripper jaw when it is retracted into the cavity for freezing the tubes, and heater means in the vicinity of said gripper jaw when it is retracted for heating said tubes.

3,934,590

OCULAR POSITIONING DROPLET DISPENSING DEVICE

Gary J. Campagna, 236 Willow Ave., and Roland C. Janson, 114 Granada Drive, both of Corte Madera, Calif. 94925

Filed Nov. 21, 1974, Ser. No. 525,761
Int. Cl.² A61M *7/00*
U.S. Cl. 128—233 **3 Claims**

1. An ocular-positioning device for a standard soft-sided squeeze bottle of ophthalmic liquid having a reduced externally threaded droplet discharge nozzle and an internally threaded closure cap threadable on said nozzle, comprising:

an open top socket having a bottom wall formed with a normally horizontally disposed medial opening therein dimensioned to receive said nozzle and having an upstanding circumferentially disposed support structure on said wall, said structure being formed to slidably receive and embrace and support in vertically inverted position the side wall of said bottle with said nozzle extending through said opening;

a leg secured to and depending from said socket and having a concavely notched lower end structured to seat upon

and rotationally index with the bridge of the user's nose and to position said opening in vertically spaced alignment over the user's eye;

a pair of legs secured to and depending from said socket and having lower ends spaced on opposite sides of the axis of said opening and spaced from said first-named end and positioned to engage and rest upon the user's brow and cheek bone and to support said nozzle in spaced relation to the user's eye, the lower ends of said legs terminating in a common normally horizontal plane substantially parallel to the plane of said opening for supporting said device and said inverted bottle on a table top or the like in the storage mode of said device; and

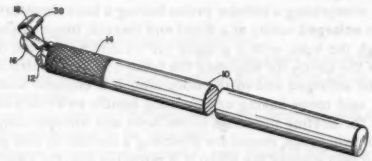
said cap being threadable onto said nozzle at the normally under side of said wall to demountably secure said bottle in inverted position in said socket in said storage mode of said device.

3,934,591

DERMATOME

Robert W. Gleason, 4608 Sharon Road, Camp springs, Md. 20031

Filed Mar. 20, 1974, Ser. No. 453,035
Int. Cl.² A61B *17/322*
U.S. Cl. 128—305.5 **11 Claims**



1. A dermatome comprising: a handle, a gripping device in the handle; blade support and cutting guide means; and cutting blade means mounted in the gripping device; said blade means comprising a generally elongate, flexible blade having a central, cutting portion and flat end portions bent from said central portion into juxtaposed, face to face abutting relationship, and said blade support and cutting guide means comprising a lateral support portion disposed beneath and generally coextensive with the long dimension of said blade central cutting portion and a base portion having means for mounting said blade flat end portions, said base portion being engaged and clamped by said gripping device, said lateral portion comprising a support, said blade central cutting portion being mounted on and over said support in predetermined spaced relationship thereto.

3,934,592

SUTURE BRIDGE

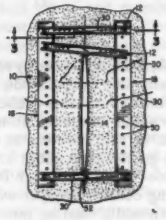
Sidney Wolvek, Brooklyn, and Sol Sobel, Manhasset Hills, both of N.Y., assignors to Technibiotics, Inc., Brooklyn, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,305
Int. Cl.² A61B *17/08*
U.S. Cl. 128—335 **11 Claims**

1. A surgical bridge assembly for retention sutures looped about an incision in the skin comprising:

at least one bridge adapted to span said incision and terminating in first and second ends having respective first and second end surfaces, with first fastening means on said first end, and second fastening means on said second end;

first and second base means positionable on opposite sides of said incision, the lower surface of each having an area greater than that of said bridge end surfaces for distributing pressure exerted by said bridge ends over a surface area greater than that of said bridge end surfaces, said first base means having a plurality of third fastener means distributed over its surface in a general direction substantially transverse to the span of said bridge and said second base means having a plurality of fourth fastener means distributed over its surface in a general direction substantially transverse to the span of said bridge, said first and third fastener means and said second and fourth fastener



means adapted to form respective releasable connections whereby said bridge may be attached to said base means at a plurality of points therealong.

3,934,593

STRAPLESS BREAST SUPPORT

Frederick N. Mellinger, Los Angeles, Calif., assignor to Frederick's of Hollywood, Hollywood, Calif.

Filed July 11, 1974, Ser. No. 487,707
Int. Cl.² A41C *3/10*
U.S. Cl. 128—480 **2 Claims**

1. A soft, pliable strapless breast support having a homogeneous construction comprised of:

a flat form having a firm border defining a soft foam contour cushion;

said flat form being comprised of:

first and second pieces of soft, pliable material;

a flexible plastic foam sandwiched between said first and second pieces of fabric;

means bonding said fabric to said plastic foam;

said border defining said contour cushion being formed by heating and compressing said fabric and said foam to produce a wide semi-circular lower border terminating in a pair of upward extending tabs and a narrow upper border slightly curved in the opposite direction from said wide border joining said wide border adjacent to said tabs;

adhesive means comprised of a non-skin sensitive adhesive coated on one side of said wide border whereby when said wide border is pressed against the chest beneath a breast and said tabs pulled upward, said contour cushion cups and supports said breast.

3,934,594
PROCESS FOR THE MANUFACTURE OF TOBACCO SUBSTITUTE

Monique Beringer, Saint Louis, France, and Paul Buchmann, Basel, Switzerland, assignors to Tamag Basel AG, Switzerland

Continuation of Ser. No. 337,479, March 2, 1973, abandoned. This application Aug. 1, 1974, Ser. No. 493,884
Claims priority, application Luxemburg, Mar. 2, 1972, 64889
Int. Cl.² A24B *15/00*; A24D *1/18*
U.S. Cl. 131—2 4 Claims

1. A homogeneous tobacco substitute which consists of:
5,000 grams of filler consisting of: one or more of gramineous plants or shells of nuts, cocoa beans or coffee beans,
600 grams magnesium formate
50 grams tartaric acid
300 grams potassium nitrate
1,000 grams paraffinurea
300 grams diammonium hydrogen phosphate
10 grams vanillylideneurea
1,500 grams sodium carboxymethylcellulose
1,400 grams glycerine
150 grams diethylene glycol
1,050 grams fruit concentrate
600 grams raw molasses
105 grams malt extract.

3,934,595
LACQUERS AND WAVESETTING LOTIONS CONTAINING METHYL METHACRYLATE-DIMETHYLAMINO-ETHYL METHACRYLATE-OCTADECYL METHACRYLATE TERPOLYMERS

Annie Madrange nee Dermain, Saint-Germain-en-Laye, and Christos Papantoniou, Epinay-sur-Seine, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Sept. 11, 1972, Ser. No. 287,845
Claims priority, application Luxemburg, Sept. 13, 1971, 63896
Int. Cl.² A61K *7/11*; A45D *7/00*
U.S. Cl. 132—7 8 Claims

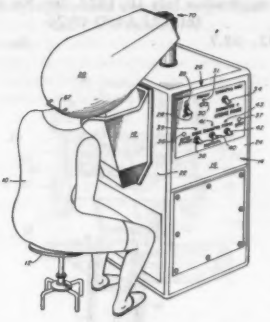
8. A process for setting hair in waves comprising applying 10–100 cc of a composition having a cosmetic vehicle selected from the group consisting of ethyl alcohol-water, isopropyl alcohol-water and ethyl alcohol-propellant gas and an effective amount of a copolymer possessing tertiary amine groups, said copolymer having an average molecular weight of about 10,000 to 1,500,000 and comprising 16–43% methyl methacrylate, 25–54% dimethylamino-ethyl methacrylate and 12–52% octadecyl methacrylate, winding the hair on curlers and drying the hair.

3,934,596
SHAMPOOING APPARATUS

George Sunthelmer, Hanover; John R. Howatt, Waltham, and Emanuel J. Consales, Winchester, all of Mass., assignors to Robert B. Patterson; Mary D. Patterson and William A. Patterson, all of Braintree, Mass.

Filed Nov. 23, 1973, Ser. No. 418,559
Int. Cl.² A45D *19/00*
U.S. Cl. 132—9 36 Claims

1. An apparatus for cleansing a person's hair and scalp comprising:
a sink having a liquid drain for removing liquid from the sink,
means for supporting the sink,
means defining a rest for the face of the person, said rest disposed in the sink in a fixed position relative to the sink and having liquid sealing means, whereupon the person may assume a seated position and have the face contacting the liquid sealing means of the rest and directed generally downwardly,
a hood means movable to cover the scalp of the person, one of said hood means and sink having liquid sealing means associated therewith,

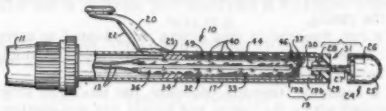


and means disposed within said hood means in a fixed position relative to the hood means for directing water or shampoo at the scalp.

3,934,597
HAIR CURLING INSTRUMENT

Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.

Filed July 17, 1974, Ser. No. 489,133
Int. Cl.² A45D *2/24*
U.S. Cl. 132—37 R 2 Claims

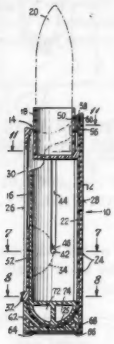


1. A hair curling instrument adapted to heat or dispense steam to curls of hair wound thereon, the instrument comprising:
handle means adapted to be grasped by the user;
steam tube means for producing and dispensing steam, said tube means interconnected with said handle means and comprising
a tubular, cylindrical outer shell, said shell having a plurality of steam passage holes defined therein,
a generally cylindrical heating tube located interiorly of said shell in coaxial relationship therewith, said heating tube including means for producing heat to vaporize liquid in contact with said heating tube,
a steam chamber adapted to receive liquid, said steam chamber being in contact with said heating tube and communicating with said steam passage holes,
baffle means in said steam chamber, said baffle means comprising a thin sheet of material curved to conform generally with the inside curvature of said tube and disposed within said tube and between said means for producing heat and said holes and including spacer means spacing said sheet from the inside of the tube to permit flow of steam between said sheet and the inside of the tube to and out through the holes, and
means for injecting liquid into said steam chamber.

3,934,598
COSMETIC HOLDER AND APPLICATOR

Thomas H. Hayes, Westport, Conn., and Efrem Ostrowsky, Highland Park, Ill., assignors to VCA Corporation, Greenwich, Conn.

Continuation of Ser. No. 323,838, Jan. 15, 1973, abandoned. This application July 10, 1974, Ser. No. 487,309
Int. Cl.² A45D 40/26
U.S. Cl. 132—88.7 17 Claims



1. A cosmetic stick holder and applicator device, comprising in combination:

a. a hollow, essentially cylindrical casing having an opening at one end,

b. an internal curved guide member closely confined within the casing,

c. a cup disposed in said casing and adapted to carry the cosmetic stick, said cup being movable longitudinally between advanced and retracted positions,

d. a bendable, tenuous, elongate, flat push-pull strip disposed within the casing and having one end portion connected to the cup to shift the latter,

e. guide means for said strip, including a direction reversing guide carried by the internal guide member, confining opposite end portions of said strip for opposite movements respectively within the casing, said strip extending along and closely adjacent to diametrically opposed portions of said casing,

f. said casing having a longitudinal slot extending along the other end portion of said strip,

g. a finger piece connected with said other end portion of the push-pull strip and extending outwardly through said slot,

h. a thin, waferlike closure member having a convex-concave shape, said member being of arcuate cross-section and having a generally oval configuration when flat,

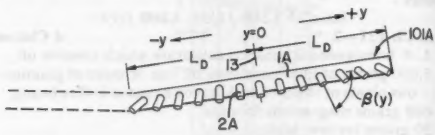
i. said closure member being connected to the other end of said push-pull strip and being movable along the inside surface of said casing from a retracted position intermediate the casing ends to an advanced, tilted position wherein it extends across and closes the open end of the casing in response to sliding of the finger piece along the slot of the casing for the purpose of shifting the cup and cosmetic stick carried thereby from the advanced to the retracted positions, and

j. cooperable means on the internal guide member and closure member for effecting said tilting of the latter as it approaches the open end of the casing.

3,934,599
SUBMERGED MULTIPORT DIFFUSERS FOR COOLING WATER DISCHARGE

Gerhard H. Jirka, Belmont, and Donald R. F. Harleman, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 10, 1974, Ser. No. 468,852
Int. Cl.² C02C 1/00
U.S. Cl. 137—1 5 Claims



5. A method of diffusing buoyant fluids, such as cooling water, sewage effluents and the like, into a large body of fluid and adapted to maximize diffusion of the discharged fluid into the ambient fluid that comprises: moving the discharge fluid along a flow duct at the bottom of the large body of fluid; discharging the buoyant fluid at a large number of locations along said flow duct, the direction of discharge of the buoyant fluid being a variable angle equal to or substantially equal to $\beta(y)$ with respect to the orientation of the flow duct, wherein

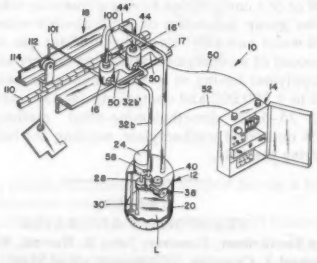
$$\beta(y) = \cot^{-1}\left(\frac{1}{\pi}\log\frac{1+y/L_D}{1-y/L_D}\right)$$

and wherein y is the distance in either direction along said flow duct measured from the center of the discharge region and L_D is the half length of the discharge region.

3,934,600
LUBRICANT SYSTEM

William C. Murphy, Fremont, Mich., assignor to Shock V Automatic Lubrication Systems, Inc., Fremont, Mich.

Continuation-in-part of Ser. No. 382,892, July 26, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,653
Int. Cl.² F16K 11/07, 3/04
U.S. Cl. 137—2 4 Claims



1. Lubricant dispensing apparatus employing a shock pulse, comprising:

lubricant source means;

recycle conduit means having an outlet from said source means and a return back to said source means;

solenoid valve means in said conduit means, including an inlet from said conduit means, a first outlet back to said conduit means, and a second outlet;

a fitting in said second outlet including at least one capillary discharge tube therefrom, for dispensing lubricant;

a valve seat at said second outlet, said solenoid valve means including a plunger shiftable from a first position on said valve seat closing said second outlet while said first outlet is open for dynamic recirculatory flow of lubricant from said source means through said conduit means and said valve means, to a second valve position momentarily

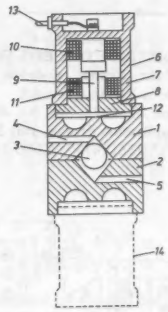
restricting the recirculatory dynamic flow while opening said second outlet and exposing said capillary outlet means to the shock pulse from the restricted dynamic lubricant flow;

said valve means having a minimal amount of volume between said valve seat and said fitting, whereby insignificant amounts of lubricant are retained downstream of said valve seat including said capillary discharge tube.

3,934,601
METHOD OF AND ARRANGEMENT FOR FEEDING PRESSURE FLUID IN PULSES

Erik Volmar Lavon, Saltsjo-Boo, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed July 15, 1974, Ser. No. 488,504
Claims priority, application Sweden, Aug. 1, 1973, 7310580
Int. Cl.² F16K *31/44*
U.S. Cl. 137—14 8 Claims



1. In a method of discharging pressure fluid through a valve by using fluid pressure as driving power, said valve including a housing, a pressure fluid conduit means in said housing, a valve body in said housing, and a valve seat in said housing on communication with said fluid conduit means for normally sealingly cooperating with said valve body to normally block said fluid conduit means, the improvement comprising:

generating shock waves in said housing by delivering impacts thereagainst for momemtarily lifting said valve body from said seat in a direction opposite to the direction of the fluid flow to momentarily unblock said fluid conduit means to discharge a pulse of pressure fluid.

5. A valve arrangement for discharging pressure fluid by using the fluid pressure as driving power comprising:

a housing;

a pressure fluid conduit means in said housing;

a valve body in said housing;

a valve seat in said housing in communication with said fluid conduit means for normally sealingly cooperating with said valve body to normally block said conduit means;

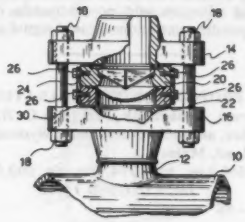
an impacting device attached to said housing; and

means for actuating said impacting device to impact said housing to generate shock waves in said housing for momentarily moving said valve body from said valve seat in a direction opposite to the direction of the fluid flow in said pressure fluid conduit means to momentarily unblock said conduit means to discharge a pulse of pressure fluid.

3,934,602
RUPTURE DISC STRUCTURE

George Robert Muddiman, Beaconsfield, and Fred Edge, Lachine, both of Canada, assignors to Process Equipment Limited, Montreal, Canada

Filed Jan. 21, 1974, Ser. No. 435,247
Claims priority, application Canada, Aug. 27, 1973, 179622
Int. Cl.² F16K *17/40*
U.S. Cl. 137—68 9 Claims

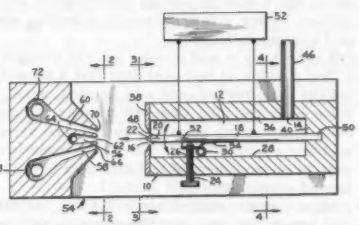


1. In a reverse buckling rupture disc device having a supporting member and a rupture disc associated therewith, the improvement wherein said device includes a sub-assembly releasably mounted in said supporting member, said sub-assembly comprising at least one cutting means, means for releasably mounting said sub-assembly to said supporting member, and means for frictionally mounting said cutting means in said sub-assembly, said cutting means comprising at least one cutting blade frictionally mounted at opposed ends thereof by said mounting means for said cutting means whereby said cutting means are releasably engageable with said sub-assembly to permit ready replacement of said cutting means when the latter has become worn or dulled.

3,934,603
FLUIDIC UPSTREAM CONTROL OF THE DIRECTIONAL FLOW OF A POWER JET EXITING A FLUIDIC POWER NOZZLE

Howard William Avery, Schenectady, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,592
Int. Cl.² F15C *3/10*
U.S. Cl. 137—83 13 Claims



1. A fluidic device having a plenum chamber, an input port to said plenum chamber for receiving a supply of fluid, and a power nozzle contiguous with said plenum chamber for generating a power jet, said device including means located upstream of said power nozzle for controlling the directional flow of the power jet exiting said power nozzle, said controlling means comprising:

a. a plate defining one end wall of said plenum chamber and having a sharp edged orifice formed within said plate to define said power nozzle;

b. an elongated movable transducer element positioned within said plenum chamber and surrounded by the gas

therewithin, one end of said element being positioned adjacent said power nozzle; and

c. means for changing the position of said one end of said element relative to said power nozzle for controlling the directional flow of the power jet exiting said power nozzle, said changing means including:

i. adjustible means for applying a fixed mechanical bias to said transducer element; and

ii. signal means coupled to said transducer element for varying the position of said one end of said transducer element adjacent said power nozzle in response to corresponding variations in said signal means.

3,934,604

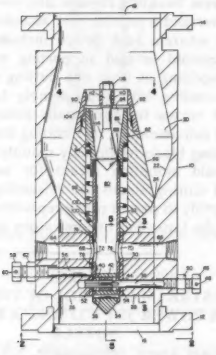
PROPORTIONING APPARATUS

Ian S. Sanderson, Kennebunk, and John C. Hardy, Gorham both of Maine, assignors to Rockwood Systems Corporation, South Portland, Maine

Filed Aug. 30, 1974, Ser. No. 502,052

Int. Cl.² G05D *11/02*

U.S. Cl. 137—98 **14 Claims**



1. Proportioning apparatus comprising:

a tubular valve housing comprising a housing inlet adapted for connection to a primary liquid source, a housing outlet, and a housing passage therebetween, said housing passage having a first outwardly extending wall facing said housing outlet;

a first valve body in said housing passage movable between a first position at said first wall and a second position remote therefrom toward said housing outlet, said first valve body and said first wall adapted for coaction to close said housing passage with said first valve body in said first position thereof and to progressively open said passage on movement of said first valve body toward said second position thereof;

a tubular sleeve mounted and extending coaxially within said housing passage, said sleeve having an outer dimension smaller than the minimum inner dimension of said housing passage, said sleeve comprising a sleeve inlet adapted for connection to a secondary liquid source, a sleeve outlet within said housing and facing said housing outlet, and a sleeve passage therebetween, said sleeve passage having a second outwardly extending wall facing said housing outlet, said first and second walls having the same cross-sectional configurations;

a second valve body in said sleeve movable between a first position at said second wall and a second position remote therefrom toward said housing outlet, said second valve body having a maximum dimension smaller than the dimension at said first position of said second valve body, of said sleeve passage, said second wall extending from said first position of said second valve body toward said second position thereof and outwardly tapered having a progressively greater inner dimension in a direction toward said second position of said second valve body, said second valve body and said second wall adapted for coaction to close said sleeve passage with said second valve body in said first position thereof and to progressively open said passage on movement of said second valve body toward said second position thereof;

said first valve body being tubular and being slidably mounted on said sleeve with said sleeve extending therethrough, said first valve body slidable on said sleeve between said first and second positions thereof;

said second valve body connected to said first valve body and movable between said first and second positions thereof with said first valve body for proportional opening of said housing and said sleeve passages together, said first and second positions of said first valve body corresponding to said first and second positions of said second valve body; and

biasing means connected to one of said valve bodies urging said valve bodies to their respective first positions.

3,934,605

MODULAR DISTRIBUTOR BOX FOR FLUIDS

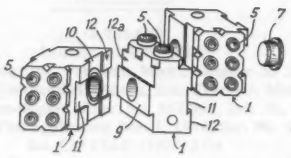
André Legris, St-Maur, France, assignor to Societe Legris France S.A., Ozoir-la-Ferriere, France

Filed June 28, 1974, Ser. No. 484,244

Claims priority, application France, July 3, 1973, 73.24472

Int. Cl.² F15C *4/00*; F16L *23/00*

U.S. Cl. 137—271 **13 Claims**



1. A modular distributor box for distributing a fluid, comprising a linear assembly of a plurality of juxtaposed modules, each said module having:

a. a prismatic module body having a pair of oppositely facing faces and further faces extending transversely to and between said opposite faces;

b. said body having a central bore, the wall of said bore defining a central conduit extending through said module body from the center of one of said oppositely facing faces to the center of the other of said oppositely facing faces and being open at its ends at said oppositely facing faces;

c. said body having at least two relatively long and narrow intersecting grooves of identical cross-section formed in one of said oppositely facing faces, each of said grooves increasing in width in the direction inwardly of said body from the oppositely facing face in which it is formed and the intersection of said grooves being at the open end of said conduit at said last-mentioned face;

d. said body having a projection extending from the other of said oppositely facing faces and having a cross-section conforming to that of each groove whereby said projection may be inserted in and interlock with either of said grooves thereby permitting one module to be secured to another module in at least two different relative positions; and

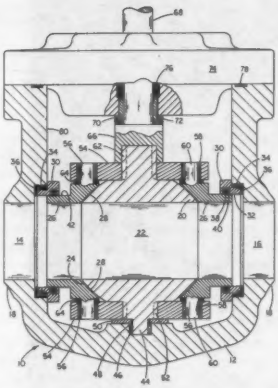
said modules being interconnected by engagement of a projection on one of the modules with one of the grooves of a contiguous module with the central conduit of one module in regis-

ter with the central conduit of said contiguous module to form a longitudinal conduit extending along said distributor box, and the body of at least one of said modules also having at least one passageway therein extending from one of said further faces of said last-mentioned body to said central conduit thereof to form a transverse conduit.

3,934,606
CAM LOCKED BALL VALVE

Raymond E. Matthews, Campbel, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed June 20, 1974, Ser. No. 481,040
Int. Cl.[2] F16K 25/00
U.S. Cl. 137—454.6 6 Claims



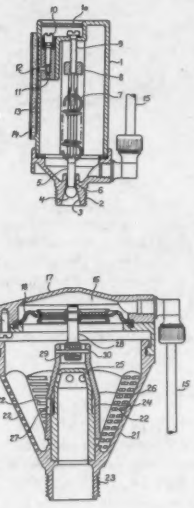
1. A trunnion mounted plug valve comprising:
a valve body having a flow passageway therethrough;
a valve seat ring in said body around said flow passageway and movable axially thereof;
a valve plug having a flow port therethrough rotatable in said body between an open position with said flow port aligned with said seat ring and a closed position blocking fluid flow through said seat ring;
a cam plate fixed on said plug around a trunnion thereof to rotate therewith;
an arcuate cam slot in said plate;
a cam follower on said seat ring extending into said slot to be engaged by opposite edges thereof;
said cam slot extending through approximately 90° around the trunnion axis and curving closer to said axis at one end thereof so that said cam slot and follower are operative to move said seat ring axially away from said plug when said plug is rotated from said closed position, to move said seat ring positively into firm engagement therewith as said plug is rotated into its closed position, and to lock it in firm engagement therewith while in said closed position.

3,934,607
CONTROL FOR VACUUM SYSTEM

Istvan Revesz, Sodertalje, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Sept. 3, 1974, Ser. No. 502,644
Claims priority, application Sweden, Oct. 11, 1973, 73/306/73
Int. Cl. G05D 16/06
U.S. Cl. 137—489.5 7 Claims

1. In combination with a vacuum system, a device for controlling the vacuum level in said system, said device comprising an indicator for sensing a deviation from a balance between a force generated by the vacuum level actually prevailing in said system and a force of constant magnitude permanently acting in the indicator, said indicator being operable to generate a deviation impulse corresponding to said deviation, an air admission valve connected to the vacuum system and having a closed chamber, and means associated with the indicator for transmitting said deviation impulse to said closed chamber for controlling the air admission valve under the guidance of said deviation impulse, the indicator including a housing having an interior and also having a throttled air admission opening through which said interior communicates with the outer atmosphere, said housing also having a throttled air discharge passage through which said interior communicates with the vacuum system, said interior also communicating through said transmitting means with said closed chamber of the air admission valve, the indicator also including a valve body actuated by said two forces for controlling the balance between the air admission into and the air discharge from the housing interior, the air admission valve including a space communicating with atmosphere and also including a valve member for controlling air flow from said space to the vacuum system, the air admission valve also including a displaceable wall having a movement-transmitting connection with said valve member, said wall having one side subjected to the pressure in said closed chamber and having its opposite side subjected to the pressure in said space.



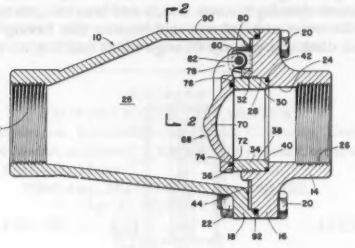
3,934,608
CHECK VALVE

Glen B. Guyton, 3401 E. Newton, Tulsa, Okla. 74115

Filed Nov. 14, 1973, Ser. No. 415,742
Int. Cl.[2] F16K 15/03
U.S. Cl. 137—527.8 3 Claims

1. A check valve comprising a first housing member having an inlet port provided therein, a second housing member removably secured to the first housing member and having an outlet port therein in substantial alignment with the inlet port, sleeve means removably secured to said first housing member in substantial alignment with the inlet port and having one end thereof extending into the interior of the second housing member to provide a valve seat for the valve, hanger means removably secured between the housing members and retained against one housing member by pressure of the other housing member thereagainst, closure means removably se-

cured to the hanger means and pivotal for cooperation with the valve seat to provide alternate open and closed positions for the valve, said closure means comprising a substantially circular body member, an angled arm member carried by the circular body and extending substantially radially outwardly therefrom, pivot shaft means removably secured to the hanger means and operably connected with the arm member for pivotally securing the closure means to the hanger means, and



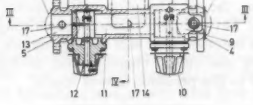
means provided on said hanger means for constantly urging the circular body in a direction toward the valve seat to compensate for any dimensional variances of the valve seat and closure means for assuring an efficient sealing of the valve in the closed position thereof, said last mentioned means comprising angularly disposed recess means provided in the hanger means for receiving the pivot shaft means therein whereby gravity constantly urges the pivot shaft in a direction toward the valve seat.

3,934,609

CONTROL UNIT FOR CENTRAL HEATING SYSTEMS

Ulw Lars Anders Häggqvist, Vadstena, Sweden, assignor to Vadstena Pumpar AB, Vadstena, Sweden

Filed Sept. 16, 1974, Ser. No. 506,112
Claims priority, application Sweden, Feb. 8, 1974, 7401681
Int. Cl.² F04B 21/02
U.S. Cl. 137—565 **1 Claim**



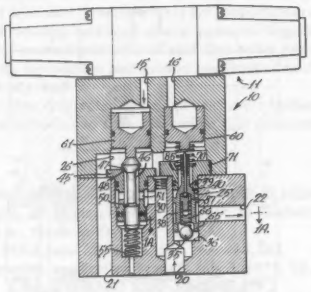
1. A control unit for central heating systems, said unit comprising a single integral body means, having therein a plurality of openings which are to be connected to main distributing and return pipes and to group distributing and return pipes, a system of enclosed channel means formed within said body, a circulation pump means, a throttle valve means, a shunt valve means and a check valve means associated with said body, a first one of said channel means connecting the opening for said main distributing pipe via said circulation pump means to the opening for said group distributing pipe, a second one of said channel means extending from the opening for said group return pipe through said throttle valve means, and said shunt valve means to the opening for said main return pipe, and a third of said channel means connecting said second channel means via said check valve means to the suction side of said circulation pump means.

3,934,610

THREE-WAY CONTROL VALVE

James C. Solie, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Filed May 13, 1974, Ser. No. 469,424
Int. Cl.² F15B 13/04, 13/043
U.S. Cl. 137—596.12 **4 Claims**

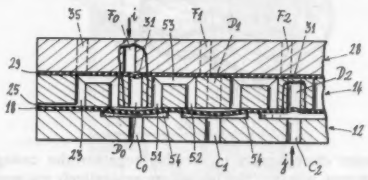


1. A three-way control valve for use with a single-acting cylinder or the like in control of advance, return or hold operation thereof comprising, a valve body having an inlet port, a control port and a tank port, a first bore in said body in communication with all three of said ports, a first poppet check valve in said first bore and having a valve seat whereby, when seated, flow from the control port to the inlet port is blocked, a second poppet check valve in said first bore and having a valve seat whereby, when seated, flow from the control port to the tank port is blocked, a second bore in said body in parallel adjacent relation to said first bore and in communication with said inlet port and the tank port, a spool valve in said second bore with spaced opposed lands and one of said lands defining a poppet valve member coacting with a valve seat to control flow to the tank port, a passage connecting said first bore with said second bore intermediate said spaced opposed lands of said valve spool for fluid flow from the inlet port to the tank port, the poppet valve member in said second bore having an open position to permit flow from the inlet port to the tank port in hold and return operations and to block said flow in an advance operation whereby fluid flows past said first check valve to said control port, means for positioning said poppet valve member, both of said check valves being held on their respective valve seats by fluid pressure in a hold operation, means for opening said second check valve and holding said first check valve closed in a return operation to permit fluid flow from the control port to the tank port, and decompression valve means operable to bleed fluid from the control port to the tank port to reduce said fluid pressure and reduce the force required to open said second check valve, said decompression valve means including a relatively small poppet valve carried by said second check valve, spring means acting between said first check valve and said small poppet valve, a movable pin for opening said small poppet valve, and a movable member for sequentially engaging said pin and said second check valve.

3,934,611
COMPARATOR FOR CODED SIGNALS REPRESENTED BY A PRESSURE OF FLUID

Jean Gachot, 26, avenue de Paris, Soisy-sous-Montmorency, Val dOise, and Simeon Lekarski, 138, boulevard de la Republique, Saint Cloud, Hauts-de-Seine, both of France

Filed July 13, 1973, Ser. No. 378,993
Claims priority, application France, Aug. 4, 1972, 72.28245
Int. Cl.² F15C 3/04
U.S. Cl. 137—608 1 Claim

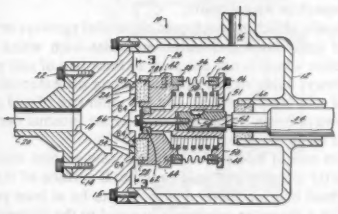


1. A comparator for signals which are coded in a predetermined number system and represented by a fluid pressure, wherein said comparator comprises a first and a second rigid block which are pierced by first and second series of transverse ducts arranged in rows to receive a fluid pressure representing respectively a first and a second input signal, at least one elastic membrane which separates the two blocks, a first and a second output duct pierced in the second block at each end of said second series of transverse ducts, means responsive to fluid pressure representing the second signal in order to deform the elastic membrane and to permit propagation of said pressure in the direction of said two output ducts, and means responsive to fluid pressure representing the first signal in order to deform the elastic membrane and to prevent propagation of said pressure representing said second input signal beyond the duct corresponding to said first input signal, the second block having between each said duct two adjacent auxiliary ducts, one end of each of said auxiliary ducts opening on the membrane, the other end of each of said auxiliary ducts being connected to each other, each duct of the first block opening into a chamber which is limited by the membrane and is so located that one duct of the second block and the two adjacent auxiliary ducts open on and are positioned to be closed by the membrane in front of said chamber upon application of said fluid pressure representing the first signal.

3,934,612
FLUID VALVE WITH WIDE TEMPERATURE RANGE

Howard Berdoit Kast, Fairfield, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed July 8, 1974, Ser. No. 486,471
Int. Cl.² F16K 47/06
U.S. Cl. 137—625.3 9 Claims



1. A valve comprising:

a housing having an inlet and outlet therefrom,

a valve plate having at least one window therethrough for receipt of a flow of fluid from the valve inlet,

a rotating member in spaced relation with the valve plate having at least one ceramic pad in sliding engagement with the face of the valve plate such that at least one edge of the ceramic pad cooperates with a respective window to form a variable area orifice,

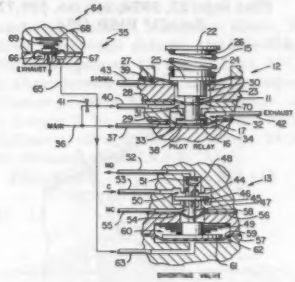
means for moving the rotating member relative to the valve plate, and

wherein the moving means includes a bellows coupling, one end of which connects to the rotating member and the other end of which connects to a rotatable shaft extending from the valve housing.

3,934,613
PNEUMATICALLY OPERATED PILOT RELAY AND SYSTEM AND DIVERTING RELAY CONSTRUCTION UTILIZING THE SAME OR THE LIKE

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 405,132, Oct. 10, 1973. This application Feb. 18, 1975, Ser. No. 550,453
Int. Cl.² G05D 23/00
U.S. Cl. 137—625.5 40 Claims



1. A pneumatically operated diverting relay construction comprising a pilot relay means and a diverting valve means operatively associated together, said pilot relay means having means for sending a pneumatic pilot output to said diverting valve means to switch said diverting valve means from one condition thereof to another condition thereof when said pilot relay means receives a pneumatic signal of a certain magnitude, said pilot relay means having means for selecting within limits the magnitude of said pneumatic signal that is required for said pilot relay means to produce said pneumatic pilot output for switching said diverting valve means from said one condition to said other condition thereof, said pilot relay means having means for terminating said pneumatic pilot output to cause said diverting valve means to switch from said other condition thereof to said one condition thereof when said pneumatic signal falls to another certain magnitude, said switching of said diverting valve means from said other condition thereof to said one condition thereof taking place with substantially a snap action.

6. A pneumatically operated control system comprising a source of fluid, a pneumatic signal producing means, a pilot relay means, and a diverting valve means, said pilot relay means having means for sending a pneumatic pilot output from said source to said diverting valve means to switch said diverting valve means from one condition thereof to another condition thereof when said pilot relay means receives a pneumatic signal of a certain magnitude from said signal producing means, said pilot relay means having means for selecting within limits the magnitude of said pneumatic signal that is required for said pilot relay means to produce said pneumatic pilot output for switching said diverting valve means from said

one condition thereof to said other condition thereof, said pilot relay means having means for terminating said pneumatic pilot output to cause said diverting valve means to switch from said other condition thereof to said one condition thereof when said pneumatic signal falls to another certain magnitude, said switching of said diverting valve means from said other condition thereof taking place with substantially a snap action.

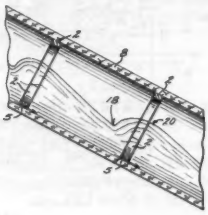
12. A pneumatically operated pilot relay means comprising a housing means, said pilot relay means having means for sending a pneumatic pilot output when said pilot relay means receives a pneumatic signal of a certain magnitude, said pilot relay means having means for selecting within limits the magnitude of said pneumatic signal that is required for said pilot relay means to produce said pneumatic pilot output, said pilot relay means having means for terminating said pneumatic pilot output when said pneumatic signal falls to another certain magnitude, said pilot relay means having means to cause said pilot relay means to be substantially snap acting when initially terminating said pneumatic pilot output.

3,934,614

ENERGY DISSIPATOR RING

Zoltan Elek, 19222 Sierra Isabelle Road, Irvine, Calif. 92664, and George M. Paulsen, 3936 W. 177th St., Torrance, Calif. 90504

Filed Sept. 23, 1974, Ser. No. 508,722
Int. Cl.² F15D 1/04
U.S. Cl. 138—44 6 Claims



2. An inclined closed liquid-carrying conduit having a plurality of spaced-apart energy dissipator rings therein, each ring comprising:

a a plurality of prefabricated ring sections, and

b an expansion device between at least two of said sections for forcing said two sections apart so as to increase the circumference of said ring until it is frictionally locked in place in said conduit.

3,934,615

SEGMENTED RIGID INSULATED CONDUIT

Paul Lukomskyj, 14386 Park Drive, and Donald James Gamble, Apt. 4, 11229 - 99 Ave., both of Edmonton, Alberta, Canada

Filed Apr. 8, 1974, Ser. No. 458,671
Int. Cl.² F16L 9/18
U.S. Cl. 138—111 6 Claims

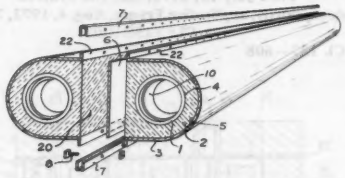
1. A longitudinally-segmented, insulated piping conduit comprising:

a plurality of spaced apart, substantially rigid conveyor pipes;

a plurality of discrete bodies of substantially rigid insulating material, each said body extending around and along the outer surface of a conveyor pipe, for insulating said conveyor pipe;

each said body having a shaped longitudinal surface section mating with a corresponding surface section of another body;

a rigid casing segment encasing each body except its shaped longitudinal surface sections; and



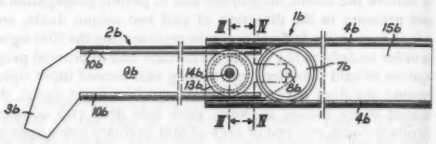
means disengagably connecting together the casing segments, whereby the bodies are protectively encased with their surface sections mated in longitudinal engagement.

3,934,616

TELESCOPIC STRUCTURE

Bernard M. Bourges, Le Plessis Belleville, France, assignor to Societe Anonyme: Poclain, Le Plessis Belleville, France

Filed Feb. 27, 1974, Ser. No. 446,232
Int. Cl.² F16L 7/00, 9/20
U.S. Cl. 138—113 2 Claims



1. A telescopic structure comprising:

at least an inner and an outer member which are telescopic one relative to the other; and

means for guiding and/or supporting one of said members relative to the other of said members in four mutually perpendicular directions, said guiding and/or supporting means comprising:

two pairs of wheels arranged between said inner and outer members,

means for coupling each of said pairs of wheels to a respective one of said inner and outer members,

means for mounting at least one of said pairs of wheels for rotation about substantially parallel axes,

a pair of parallel runways in respect of each of said wheels, situated one on each side of the rotational axis of the respective wheel and on which the peripheral surface of the respective wheel bears,

means rigidly attaching each pair of parallel runways to that one of said inner and outer members with which the respective wheel is not coupled, at least two of said pairs of runways being rigidly attached along the external corners of said inner member, and the other two of said pairs of runways being rigidly attached to the internal corners of said outer member,

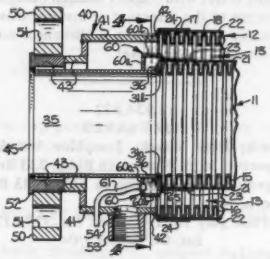
and wherein one of said runways has a cross-section which is at least partly circular and said peripheral surface of the respective wheel bearing thereon is shaped to be at least partly toroidal with a diameter substantially equal to the diameter of the circular part of said runway and the diameters of the wheels bearing thereon being larger than the diameters of the other wheels.

3,934,617

CORRUGATED JACKETED PIPE ASSEMBLY HAVING VENTED ENCLOSURES FOR CONNECTING WELDS

James R. Henderson, Charlotte, N.C., assignor to Controls Southeast, Inc., Charlotte, N.C.

Filed Aug. 26, 1974, Ser. No. 500,698
Int. Cl.² F16L 9/18
U.S. Cl. 138—114 21 Claims



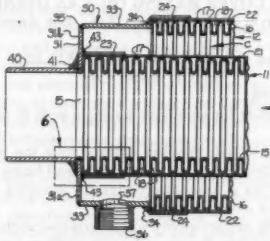
1. A jacketed pipe assembly constructed to avoid cross-contamination and comprising inner and outer tubular members arranged in spaced relation to each other and defining therebetween a fluid-circulating chamber adapted for the circulation therethrough of a temperature controlling fluid for aiding in the flow of a processing fluid through said inner tubular member, said inner and outer tubular members including respective inner and outer elongate corrugated metal tubes, a metal coupling sleeve serving as an extension of said inner corrugated tube and having its inner end abutting one end of said inner corrugated tube, a continuous weld encircling the inner end of said coupling sleeve and connecting the same to the end of said inner corrugated tube, means connecting said coupling sleeve to the end of said outer tubular member and defining therebetween one end of said fluid-encirculating chamber, means within said fluid-circulating chamber surrounding said continuous weld and defining a closed passageway enclosing said continuous weld therein, and vent means communicatively connecting said closed passageway exteriorly of the pipe assembly whereby, in the event of rupture of the continuous weld, leakage into the closed passageway from within said inner corrugated tube will be vented to the exterior of both tubular members and thereby prevent cross-contamination.

3,934,618

JACKETED PIPE ASSEMBLY FORMED OF CORRUGATED METAL TUBES

James R. Henderson, Charlotte, N.C., assignor to Controls Southeast, Inc., Charlotte, N.C.

Filed Aug. 26, 1974, Ser. No. 500,744
Int. Cl.² F16L 9/18
U.S. Cl. 138—114 26 Claims



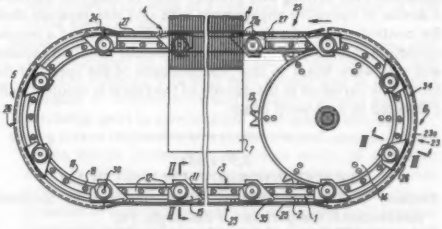
1. A jacketed pipe assembly constructed to avoid cross-contamination and comprising inner and outer tubular members arranged in spaced relation to each other and defining therebetween a fluid-circulating chamber adapted for the circulation therethrough of a temperature controlling fluid for aiding in the flow of a processing fluid through said inner tubular member, and inner and outer tubular members including respective inner and outer elongated corrugated metal tubes, an endless metal member surrounding one end of said inner corrugated tube and extending radially outwardly therefrom, means interposed between and sealingly interconnecting the radially outer portion of said endless metal member and the adjacent end of said outer tubular member to define therewith one end of the fluid-circulating chamber, a metal coupling sleeve serving as an extension of said inner corrugated tube and having its inner end abutting said one of said inner corrugated tube, and a continuous exterior weld encircling the inner end of said coupling sleeve and connecting the same to the end of said inner corrugated tube and to said endless metal member whereby in the event of rupture of the continuous exterior weld, leakage therethrough from within said inner corrugated tube or from said surrounding fluid-circulating chamber will be vented to the exterior of both tubular members and thereby prevent cross-contamination.

3,934,619

APPARATUS FOR GUIDING WEFT THREAD CARRIERS THROUGH THE SHED OF A LOOM OF THE SUCCESSIVE SHEDDING TYRE

Evgeny Dmitrievich Loschilin, Kashirskoe shosse, 36, kv. 87, Domodedovo Moskovskoi oblasti; Alexandr Lvovich Galperin, ulitsa Moldagulovoi, 10, korpus 2, kv. 166, Moscow; Alexandr Alexandrovich Zabotin, ulitsa Profsojuznaya, 96, kv. 85, Moscow; Eduard Arshakovich Onikov, ulitsa Panferova, 5, korpus 2, kv. 106, Moscow, and Boris Alexandrovich Sakharov, ulitsa Krzhizhanovskogo, 24/35, korpus 6, kv. 404, Moscow, all of U.S.S.R.

Filed Oct. 2, 1974, Ser. No. 511,115
Int. Cl.² D03D 47/26
U.S. Cl. 139—12 3 Claims



1. An apparatus for guiding weft thread carriers through the successive sheds of a loom of the progressive shedding type, comprising: an encless chain conveyor including a plurality of interconnected links; first members mounted on some of said links and adapted to cooperate with said weft thread carriers for driving same within the shed of said loom; other members mounted on other ones of said links and adapted for cooperation with said weft thread carriers for driving same outside said shed; a stationary substantially closed endless guideway accommodating said endless chain conveyor for travel therealong and including straight and curving portions, said weft thread carriers moving in operation along said guideway; a side wall mounted externally on said guideway, including straight and curving portions corresponding in shape to said respective straight and curving portions of said guideway, said side wall serving as a guide for the lateral side of each said weft thread carrier, said side wall at said curving portions thereof being L-shaped in cross section, one end thereof being mounted on said guideway so that the free end thereof faces said weft thread carrier; an arcuate groove made in the lateral side of each said weft thread carrier adapted to cooperate with said side wall, said groove being adapted to receive said free

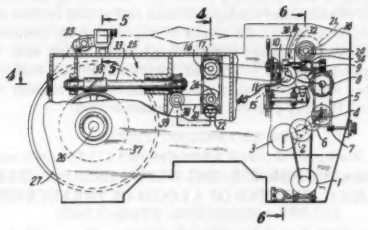
end of said curving portion of said side wall as said weft thread carrier moves during operation along said respective curving portions of said guideway.

3,934,620

SYNCHRONIZING APPARATUS FOR THE DRAWING ROLLER AND THE WARP BEAM IN A LOOM

Francisco Mariasca Garcia, 44 Plaza Castilla Sabadell, Barcelona, Spain

Filed Nov. 15, 1973, Ser. No. 416,058
Claims priority, application Spain, Nov. 24, 1972, 408963
Int. Cl.² D03D *49/06, 49/20*
U.S. Cl. 139—99 **4 Claims**



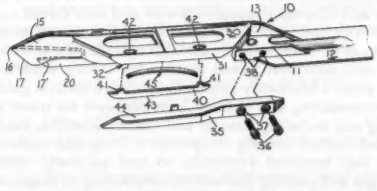
1. Apparatus for use in a loom including a drawing roller and a warp beam for affording automatic and synchronized drive between said drawing roller and said warp beam, comprising means for affording direct transmission between said drawing roller and said warp beam, said means including an intermediate shaft, a first reduction assembly in engagement with said intermediate shaft for driving said drawing roller, a first variator having a primary shaft, a pinion on said intermediate shaft for driving said primary shaft of said first variator, a device in operative engagement with said intermediate shaft for controlling the density of the fabric loomed, and a second reduction assembly in operative engagement with said variator and said warp beam so that, independent of the speed of the loom, any variation in the density of the fabric is automatically corrected in said warp beam.

3,934,621

CARRIER FOR SHUTTLELESS LOOMS

Anthony J. Tosches, Milford, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 18, 1975, Ser. No. 559,498
Int. Cl.² D03D *47/22*
U.S. Cl. 139—122 N **4 Claims**



1. An improved carrier for inserting weft yarn into the shed formed between warp yarns on a loom of the type in which the weft yarn is supplied from a source outside of the warp and is inserted into the shed by a carrier which is attached to a reciprocating carrier, said improved carrier comprising:

1 a main body portion for attachment to the inserter

2 a rear wall extending outwardly from said main body in a direction away from the inserter

3 an upper extension extending outwardly from said rear wall to a terminus and having a generally downwardly facing yarn engaging surface,

4 a lower extension extending outwardly from said rear wall to a terminus and having a generally upwardly facing yarn engaging surface, and

5 said yarn engaging surfaces of said upper and lower extensions being

a. laterally offset with respect to each other in a direction transverse to the direction of inserter travel and

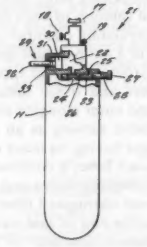
b. vertically overlapping in a direction normal to the directon of inserter travel.

3,934,622

TIRE SAVER

George Vitack; Rose Vitack; Josephine Vitack, all of c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, all of New York, N.Y. 10007

Filed July 16, 1973, Ser. No. 379,617
Int. Cl.² B65B *3/04*
U.S. Cl. 141—18 **2 Claims**



1. An air pressure tank for tire inflation, comprising an air pressure storage chamber, a tire inflation chamber, an inlet to said inflation chamber and a partition separating the storage chamber from the inflation chamber, including a passageway through said portion providing communication between said chambers, in further combination with a normally closed valve controlling flow through said passageway, including an inlet valve mounted in said inlet for filling the tank with air, further including a pressure guage mounted in the inflation chamber and extending slidably through the tank to the exterior to indicate the pressure in said inflation chamber, in still further combination with a tire inflation valve communicating with the inflation chamber for tire inflating purposes.

3,934,623

VALVE COVER HAVING OIL CAN OPENER

Wilford R. Hays, 2218 Princeton Ave., Los Angeles, Calif. 90026

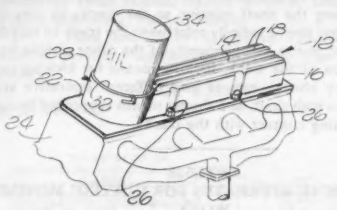
Filed Oct. 30, 1974, Ser. No. 519,089
Int. Cl.² B65B *3/04*
U.S. Cl. 141—98 **7 Claims**

1. A valve cover for an engine having a built in can opener comprising:

an elongated trough member defined by a top wall and a side wall, the free edges of said side wall being integrally connected to a mounting flange for securing the valve cover to an engine block;

a cylindrically-shaped cavity whose axis intersects the plane of said mounting flange said cavity walls extending from said valve cover mounting flanges to a top wall adjacent said valve cover top wall and having means for opening oil cans inserted therein, said cavity walls being integrally

formed with said valve cover side wall and said mounting flange; and



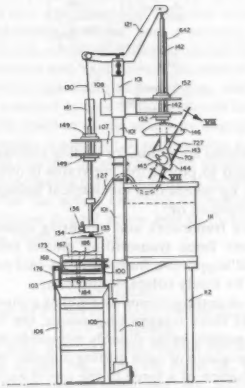
a removable cap positioned over said cavity adjacent said valve cover top wall.

3,934,624

ACID FILLING APPARATUS FOR BATTERIES OR THE LIKE

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Dec. 10, 1973, Ser. No. 423,317
Int. Cl.[2] H01M 7/00; B65B 3/06
U.S. Cl. 141—100 **6 Claims**



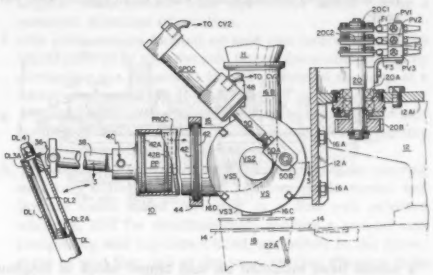
1. In the battery manufacturing art, apparatus for simultaneously depositing predetermined metered amounts of fluid into different separated cells of a battery at a predetermined location comprising: a supply tank for containing fluid; ladling means carried outside the tank but mounted for immersion in said tank to collect therefrom a predetermined amount of fluid; wherein said ladling means has separated independent chambers corresponding respectively to each separate cell in said battery and comprises a casing having a bottom portion and side portions, said bottom portion defining separate gravity flow outlet ports for each said chamber and said side portions defining at least one drainage port for each said chamber for independently limiting the fluid content of each said chamber of said ladling means, said casing having opening means at an upper end separate from said gravity flow outlet ports, for inflow of fluid upon immersion of said ladling means; means for connecting said ladling means to said battery for transferring fluid therebetween; and means mounting said ladling means for periodic immersion in said tank and for raising said ladling means above said predetermined location, whereby the fluid automatically flows under the influence of gravity from said ladling means to said battery.

3,934,625

FOOD DISPENSING VALVE MEANS AND CONTROL SYSTEM FOR AUTOMATIC CONTAINER FILLING MACHINES

Stanton W. Tiernan, Baltimore, and Richard R. Epple, Glen Burnie, both of Md., assignors to Maryland Cup Corporation, Owings Mills, Md.

Filed Sept. 30, 1974, Ser. No. 510,575
Int. Cl.[2] B65B 3/04
U.S. Cl. 141—115 **19 Claims**



1. Means for dispensing measured charges of food product and the like from a feed hopper to each of a plurality of containers presented in sequence at a filling position, comprising:

a product cylinder having a piston reciprocable therein to provide charge and discharge strokes;

valve means having a charging port communicating with said feed hopper, a product port communicating with said product cylinder, a discharge port proximate to said container filling position and a valve element selectively interconnecting said product cylinder with said feed hopper and said discharge port;

first drive means reciprocating said piston to draw and return food product from and to said feed hopper and to discharge food product through said discharge port from said product cylinder as a function of the position of said valve element; and

second drive means for said valve element positioning said valve element in a first position to interconnect said product cylinder with said feed hopper and in a second position to interconnect said product cylinder with said discharge port in synchronism with said piston; and

timing means responsive to a predetermined position of said piston means during said discharge stroke to constrain said second drive means to switch said valve element from said second to said first position such that the remainder of said discharge stroke will return food product from said product cylinder back to said feed hopper and abruptly cut off the flow of food product through said discharge port to agitate the food product in said hopper and preclude tailing at said discharge port.

3,934,626

ANTI-DRIP INJECTION NOZZLE FOR PLASTIC MOLDING

John L. Hall, 1491 Mar Vista Ave., Pasadena, Calif. 91104

Filed May 17, 1974, Ser. No. 470,842
Int. Cl.[2] B65B 3/04, 39/02
U.S. Cl. 141—117 **4 Claims**

1. An anti-drip plastic material injection nozzle for pressing against the sprue bushing of a plastic-receiving mold comprising:

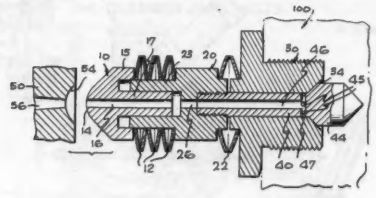
a valve block for securement to a plastic conditioning chamber containing molten plastic, a first central bore through said valve block, a valve seat terminating said first central bore at its conditioning chamber end;

a valve stem disposed within said first central bore in slidable engagement with said valve block and having a valve head on one end adapted to seat against said valve seat

and having a second and opposite end exterior of said valve block, said valve stem having a second central bore coaxial with said first central bore and extending from said second end to said valve head;

a tappet block mounted on said second end of said valve stem, a third central bore through said tappet block and in alignment with said second central bore;

a primary spring disposed between said valve block and said tappet block in compression so as to tend to maintain separation between said tappet block and said valve block for tending to maintain said valve head against said valve seat;



a nozzle head mounted on said tappet block in longitudinally slidable engagement therewith and having a fourth central bore therethrough in alignment with said third central bore; and

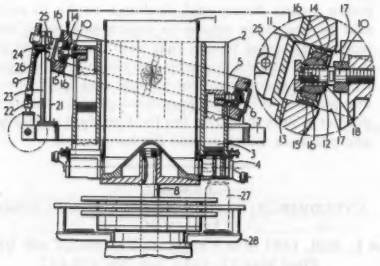
a secondary spring mounted between said tappet block and said nozzle head and tending to urge said nozzle head away from said tappet block, said secondary spring having a lower spring rate than said primary spring so that said secondary spring acts to maintain sealing engagement between said nozzle head and said sprue bushing effectively independently of said primary spring, and such plastic material being confined in its travel from such conditioning chamber through said aligned bores to said sprue bushing.

3,934,627

FILLING MACHINES

Douglas Stewart Buick, 8 Duff St., Dundee, Scotland

Filed Aug. 15, 1974, Ser. No. 497,725
Int. Cl.² B65B *57/06*
U.S. Cl. 141—146 **10 Claims**



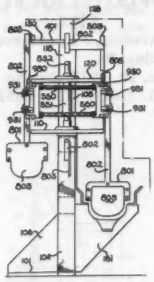
1. A filling machine for filling containers includes a receptacle for holding the substance to be filled, cylinders disposed in a circle around the exterior of the receptacle, the axes of the cylinders being vertical, a piston slidable in each cylinder, an endless track member presenting parallel upper and lower tracks surrounding the central receptacle, means for altering the angles the planes of the upper and lower tracks make with the axes of the cylinders, means for rotating the central receptacle and the cylinders about the vertical axis of the central receptacle relatively to the track, feeding means for containers to be filled located below the cylinders, a stub shaft supported by each piston and projecting radially outwards from the axis of the receptacle, a sleeve mounted on each stub shaft coaxially therewith and axially movable to different operative positions along the shaft relative to the track, to vary the position of that sleeve radially relative to the track to vary the stroke of that piston independently of the other pistons for a given position of the track, locking means for locking each sleeve in any chosen one of said different operative axial position on its stub shaft, and slipper means supported by each sleeve in sliding contact with the tracks.

3,934,628

MECHANICAL APPARATUS FOR CUTTING MOVING WORK

Fred J. Salemme, Stockton, Calif., assignor to California Cedar Products Company Inc., Stockton, Calif.

Filed Mar. 31, 1975, Ser. No. 563,803
Int. Cl.² B27M *3/00*; B26D *1/56*
U.S. Cl. 144—2 R **10 Claims**



1. A mechanical apparatus for cutting moving work wherein the energy used to power the apparatus is obtained from the moving work by means of a mechanical linkage, said apparatus being comprised of:

a supportive framework and mounting means;

one or more force transmitting means suitably mounted upon said supportive framework on said mounting means so as to be freely rotatable thereon;

a plurality of cutting means assemblies mounted at intervals upon said force transmitting means, the cutting member of said asembly being slidably moveable therein, with the vertical position of each cutting member being controlled by application of a force to the top of each cutting member;

a cam member placed in the path of the cutting member at a first station such that when the cutting member encounters the cam an upward force is exerted upon the cutting member thus moving the cutting member from a lower position to a higher position and moving the cutting member out of the path of the moving work;

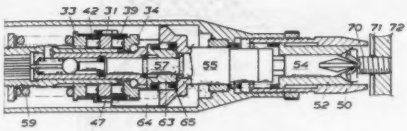
a guide member located in the path of the cutting member at a second station such that when the cutting member encounters the guide member a downward force is exerted upon the cutting member thereby causing the cutting member to move from its raised position to its lowered position and sever the moving work;

a work guiding means which guides the moving work along a path such that the moving work encounters a first cutting member in its lowered position, thereby exerting a force upon said first cutting member which force is transmitted through the cutting means assembly and along the force transmitting means to a second cutting member at this second cutting member encounters the guide means at the second station and moves from its raised to its lowered position, said second cutting member thereby simultaneously severing the moving work and assuming the role of said prior first cutting member.

3,934,629
SCREW DRIVER

Carl-Edvard Fison Boman, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 23, 1974, Ser. No. 535,684
Claims priority, application Sweden, Jan. 15, 1974, 7400513
Int. Cl.² B25B 21/00
U.S. Cl. 144—32 17 Claims

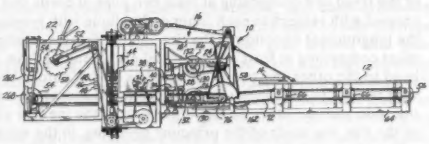


1. Screw driver for driving a screw into a screw bed, comprising:
a housing (11),
a motor (14) located in said housing,
a power transmission and an output spindle (54,55) coupled to said motor, said power transmission including a torque limiting device (31, 39, 34) which comprises a driving member and a driven member, said driving and driven members having means to slip relative to each other as a predetermined torque magnitude is reached;
locking means (47, 64, 54, 55) coupled to said torque limiting device and manually shiftable between a first, normal tightening position and a second, high torque level position in which said locking means interlocks said driving member and said driven member of said torque limiting device against relative slipping, and
means (50) coupled to said locking means for sensing the actual, axial position of the screw by engaging the screw bed, and means connected to said sensing means (50) for shifting said locking means from said second high torque level position toward said first, normal tightening position responsive to the screw reaching a predetermined axial position relative to said screw bed to thereby reactivate said torque limiting device.

3,934,630
METHOD AND APPARATUS FOR PRODUCING ROUGH CUT LUMBER

Roy R. Cockle, P.O. Box 323, Roy, Wash. 98580

Continuation of Ser. No. 351,199, April 16, 1973. This application Jan. 9, 1975, Ser. No. 539,930
Int. Cl.² B27M 1/00; B27B 1/00; B27C 1/08
U.S. Cl. 144—39 13 Claims

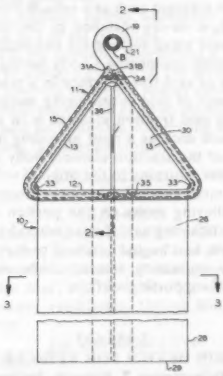


1. Apparatus for producing lumber for a log comprising:
a. a frame assembly having a log infeed end and a lumber outfeed end with a linear travel path therebetween to be traversed by the longitudinal center axis of a log being formed into lumber,
b. a pair of opposed top and bottom rotary particle-forming cutter heads adapted to form parallel planar top and bottom surfaces on a log, said cutter heads having a common direction of rotation thereby exerting a lateral force on the log directed toward one lateral side of the travel path,
c. an infeed kerf cutter arranged to form a bottom longitudinal kerf in the portion of the log to be cut away by said bottom cutter head,
d. a bottom guide rail adjacent said kerf cutter and adapted to slide in said kerf,
e. a pair of opposed side rotary particle-forming cutter heads located between said kerf cutter and said top and bottom cutter heads and adapted to form parallel planar surfaces along the lateral sides of the log whereby said pairs of cutter heads can collectively form a cant of rectangular cross-section, said side cutter heads having a common direction of rotation,
f. side guide means located on said one lateral side of the travel path so as to resist said lateral force component by contacting the respective lateral surface of the cant at a location adjacent the top and bottom cutter heads,
g. bottom guide means located on the outfeed side of said bottom cutter head and adjacent thereto for contacting the bottom surface of the cant,
h. first adjusting means on the frame assembly for moving said kerf cutter, bottom rail, bottom guide means and bottom cutter head vertically as a first unit selected amounts, and for simultaneously moving a second unit comprising said top cutter head, oppositely to the movement of said first unit at the same vertical distance from said travel path as the first unit,
i. second adjusting means on the frame assembly for horizontally moving as a third unit said side guide means and the respective side cutter head, and for simultaneously moving a fourth unit comprising the other side cutter head oppositely to the movement of said third unit the same distance from said travel path as the third unit, and
j. infeed and outfeed conveyor means carried by said frame assembly for moving a log along said travel path.

3,934,631
CLOTHES BAG AND SUSPENSION HANGER THEREFOR

Michael C. Wilson, Wheaton, Ill., and Leslie E. Schnick, Anchorage, Alaska, assignors to Pretty Products, Inc., Coshocton, Ohio

Filed Jan. 24, 1974, Ser. No. 436,109
Int. Cl.² A45C 11/00
U.S. Cl. 150—1 9 Claims



1. A clothes bag and detachable suspension hanger comprising;
a rigid frame having peripheral elements defining a a predetermined open area in the plane of the elements and including a hanger element adapted to engage a support member for suspending said frame therefrom with the peripheral elements disposed in a substantially vertical plane, said peripheral elements being formed with a pe-

ripherally extending channel opening radially outward and having at least a portion of an element extending transversely to a vertical axis when said frame is vertically suspended with said portion disposed at a side of said frame opposite to said hanger element, said portion having a support element formed therewith, and

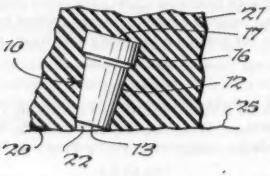
a flexible-walled bag attached to said rigid frame in depending relationship, said bag having a main body including front and rear wall panels disposed in superimposed relationship with the rear panel extending a distance beyond the one end of the front panel and with peripheral edges of the front and rear panels at that end cooperatively defining an opening disposed in a plane parallel to the plane of the panels, said peripheral edges defining said opening provided with a drawstring for constrictively and releasably securing said peripheral edges in said channel of said frame to secure said bag thereto with the bag opening in alignment with the open area defined by the peripheral elements of said frame, said drawstring engageable with said support element for support of the bag.

3,934,632

TRACTION-INCREASING DEVICE

Thomas G. Kalpin, 151 Jackson Ave., and Howard J. Ross, 56 Leonhardt Ave., both of North Tonawanda, N.Y. 14120

Filed Apr. 15, 1974, Ser. No. 460,963
Int. Cl.² B60C *11/00*
U.S. Cl. 152—210 **13 Claims**



1. In a traction element such as a vehicle tire having a tread or wear surface, a device installed in the traction element body adjacent said tread surface for enhancing traction and stability, said device comprising a body having an end surface spaced inwardly of said tread surface in a manner defining a recess, the volume of said recess being reduced to substantially zero when said traction element is in a position on a supporting surface such as a road providing maximum stress on the portion of the traction element body containing said device, said recess returning to the original volume thereof as said traction element moves further on said supporting surface in a manner relieving stress on the portion of the traction element body containing said device whereby suction is created in said recess as it begins to return to the original volume thereof thereby increasing traction between said traction element and said supporting surface.

3,934,633

ANTISKID DEVICE FOR VEHICLE TIRES

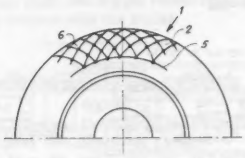
Karl Bula, Gladiolenstrasse 2, Seuzach, Switzerland

Filed Feb. 25, 1975, Ser. No. 552,951
Claims priority, application Switzerland, Feb. 27, 1974, 2773/74; Jan. 15, 1975, 450/75
Int. Cl.² B60C *27/08*
U.S. Cl. 152—221 **19 Claims**

1. An antiskid device for use on a vehicle tire comprising first and second end rings;

a plurality of flexible, substantially nonextensible hooplike strands in approximate side-by-side relationship between said end rings; and

a plurality of connection means for connecting spaced-apart points on each of said strands to the next adjacent strands and for connecting points on the ones of said strands adjacent to said end rings to said rings, the points of connection being alternately circularly offset to form an annular meshwork between said rings,



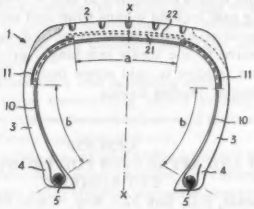
said meshwork being significantly more expansible in directions perpendicular to tangents of the annular meshwork than in directions parallel to the tangents, whereby said meshwork can be placed around a vehicle tire to cover the tread and a portion of each sidewall thereof.

3,934,634

RADIAL TIRE WITH AUXILIARY CARCASS PLIES

Henri Verdier, Beauregard-l'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand (Pay-de-Dome), France

Filed Feb. 22, 1974, Ser. No. 444,751
Claims priority, application France, Mar. 2, 1973, 73-08026
Int. Cl.² B60C *5/08*, *9/10*
U.S. Cl. 152—354 **8 Claims**



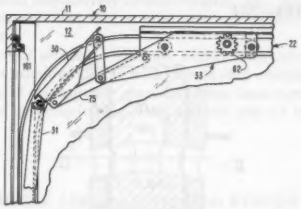
1. A pneumatic tire comprising a tread, a pair of beads, a carcass reinforcement and a tread reinforcement, the tread reinforcement having a width substantially equal to the width of the tread and comprising at least two plies of cords that are crossed with respect to each other and oblique with respect to the longitudinal direction of the tire and the carcass reinforcement comprising at least one principal ply extending from one bead to the other and two auxiliary plies having cords oblique with respect to the longitudinal direction and arranged one on one side and the other on the other side of the median plane of the tire, the cords of the principal ply being, in the zones in which the auxiliary plies are mounted, oblique with respect to the radial direction of the tire and, in three zones, radial, two of the zones of the principal ply in which the cords of the principal ply are radial being respectively near the two beads and each extending over at least ⅛ of the width of the principal ply, the third of the zones of the principal ply in which the cords of the principal ply are radial also extending over at least ⅛ of the width of the principal ply, said zones in which the auxiliary plies are mounted lying partly under said tread reinforcement and said zones extending beyond said tread reinforcement at least into the shoulder area, and the entirety of said third of the zones of the principal ply lying under said tread reinforcement.

3,934,635

OVERHEAD DOOR FOR A CONTAINER HAVING A VERTICAL OPENING SUCH AS A TRUCK TRAILER

Henry Kin, Forest Park, Ohio, assignor to KRS Industries, Inc., Forest Park, Ohio

Filed Oct. 17, 1972, Ser. No. 298,331
Int. Cl.² E05F *11/00*
U.S. Cl. 160—189 6 Claims



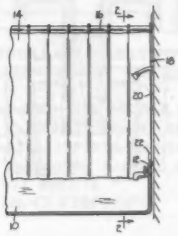
1. A manually movable overhead door for closing an opening in a wall of a container including a plurality of panels, hinge means for connecting said panels to each other, track means supported by walls of the container on each side of the door, said panels being movably supported by said track means, said track means on each side of the door including a vertical portion, a horizontal portion, and a curved portion connecting said vertical portion and said horizontal portion to each other, each of said horizontal portions being disposed substantially inwardly in the container of the vertical portion of said track means, a carriage connected to the uppermost of said panels and movably supported only on said horizontal portions of said track means irrespective of the position of said panels, counterbalance means supported on said carriage to exert a counterbalance force to said panels in accordance with the position of said panels on said track means, and means to decrease the counterbalance force produced by said counterbalance means as said panels are raised toward the full open position of the door, said decreasing means including means supported on each side of the door and means cooperating with said supported means and acting on said counterbalance means to decrese the counterbalance force as said panels are raised toward the full open position of the door, said supported means including a rack supported on each side of the door, each of said racks terminating prior to the plane containing the door when the door is in its closed position, and said cooperating means including gear means connected to said counterbalance means and engaging the teeth of each of said racks, each of said racks being supported by said track means, each of said racks extending for only the length of said horizontal portion of said track means, said counterbalance means including a spring having one end fixed to said carriage and its other end connected to said gear means, said gear means being rotatably mounted on said carriage whereby rotation of said gear means unwinds said spring as said panels are raised toward the full open position of the door, means to lock the lower most of said panels when the door is in its closed position, said lock means including first means adjustably supported on each side of the door and second means carried by the lower most of said panels and cooperating with each of said first means, said second means of said lock means including a first pair of members movably supported by the lower most of said panels, a second pair of members connected to said first pair of members and movably supported by the lower most of said panels, means cooperating with said second pair of members to move each of said first pair of members into engagement with a corresponding one of said first means, and said cooperating means being removably supported by said lower most panel to enable said first and second pairs of members to be adjustably positioned in accordance with the width of said door.

3,934,636

SHOWER CURTAIN HOLDER

Jimmy W. Simmons, 2400 Haworth, Apt. 13, Newberg, Oreg. 97132

Filed Sept. 20, 1974, Ser. No. 507,598
Int. Cl.² A47H *1/00*
U.S. Cl. 160—349 R 4 Claims



1. In a shower of the type having a bathtub with a top peripheral flange and also having a flexible shower curtain on one side and a wall surface on another side against which it is desired that an end of the shower curtain have close association to prevent water from the shower splashing on the floor, the improvement compressing a shower curtain holder comprising:

a. a body portion having a vertical guideway open at the bottom,

b. means arranged to mount said body portion on a wall surface above the bathtub flange,

c. and a slide member disposed in said guideway having a lower end arranged to project beyond the open bottom of said vertical guideway,

d. said slide member having movement in said guideway between a pair of set positions,

e. one of said set positions comprising a lowered position arranged to clamp a portion of the shower curtain which has been inserted under the holder down on the bathtub flange to hold the curtain close to the wall surface and the other of said set positions comprising an upper position for releasing the shower curtain.

3,934,637

CASTING OF MOLTEN METALS

Pierre Roger Potier, La Celle-Saint-Cloud, France, assignor to Foseco International Limited, Birmingham, England

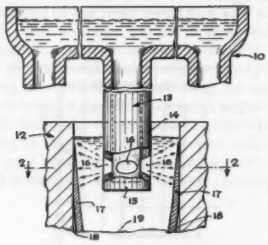
Filed Mar. 14, 1974, Ser. No. 451,369
Claims priority, application United Kingdom, Mar. 28, 1973, 14954/73
Int. Cl.² B22D *27/18*
U.S. Cl. 164—56 7 Claims

1. In the process of ingot casting wherein molten metal is bottom poured into an ingot mould to form an ingot, the improvement which comprises locating in the ingot mould, prior to the commencement of pouring, a bonded composition comprising at least one fluxing agent and expandable graphite, said composition being borne up on the rising molten metal surface as the molten metal is poured and disintegrating because of the heat of said metal and the expansion of the graphite and thereafter fusing to form a fluxing cover on the surface of the molten metal thereby minimizing surface oxidation and surface inclusions.

3,934,638
CONTINUOUS CASTING PROCESS

Robert W. Joseph, Scherervilie, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Feb. 8, 1971, Ser. No. 113,156
Int. Cl.² B22D 11/16
U.S. Cl. 164—89 7 Claims



1. In a process of continuous casting molten ferrous metal in which molten ferrous metal is introduced into the upper end of a continuous casting mold through a feeding nozzle having one end portion submerged in a pool of the molten ferrous metal maintained in the upper end of said mold to form a ferrous metal continuous casting having an improved internal structure including being free of axial voids and concentrations of segregated impurities in the axial zone of said casting, the improvement which comprises; continuously feeding molten ferrous metal into the upper end of a continuous casting mold through the submerged end portion of said feeding nozzle while maintaining said molten metal at a temperature sufficiently above the liquidus temperature of said ferrous metal to avoid skulling in said nozzle and not so high that the temperature of the molten ferrous metal can not be reduced to at least the liquid temperature thereof before descending into the deep liquid core zone of said casting, and cooling said molten ferrous metal to at least the liquidus temperature of said ferrous metal before said molten ferrous metal descends into the deep liquid core zone of said casting and while said molten ferrous metal remains between about the upper edge of said casting and a point above the lower end of said mold about where said casting initially forms an air gap by separating from the inner surface of said mold, and said cooling being effected by discharging said molten ferrous metal laterally from said feeding nozzle disposed axially in said mold with the said molten ferrous metal flowing generally radially outwardly directly into contact with each of the interior lateral surfaces of said casting.

3,934,639
METHOD OF MARKING AN INGOT

Peter Richard McCrainor, and Bryan William Edwards, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

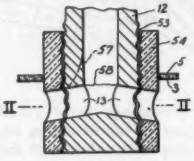
Filed Apr. 4, 1974, Ser. No. 458,039
Claims priority, application United Kingdom, May 9, 1973, 22156/73
Int. Cl.² B41B 11/62; B22D 19/00
U.S. Cl. 164—100 10 Claims

1. In the method of marking an ingot the improvement which comprises locating on at least one face of the cavity of an ingot mould at least one shaped body defining indicia and formed of a material comprising a foam plastics substrate supporting within its structure particulate refractory material bonded with a refractory binder, and casting molten metal into the ingot mould to form an ingot.

3,934,640
SUBMERGED NOZZLE FOR CONTINUOUS CASTING

Friedhelm Neumann, Adliswil, and Josef K. Zeller, Weesen, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Division of Ser. No. 72,692, Sept. 16, 1970, Pat. No. 3,800,853. This application Dec. 11, 1973, Ser. No. 423,757
Claims priority, application Switzerland, Sept. 16, 1969, 13937/69
Int. Cl.² B22D 11/10
U.S. Cl. 164—281 1 Claim

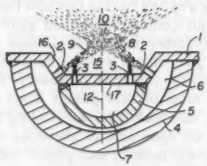


1. Apparatus for the continuous casting of steel, comprising a casting mold, a tubular nozzle extending into said mold with its lower end adapted to be submerged in the molten metal in the mold, and a refractory ring surrounding said nozzle and concentric therewith, said ring adapted to extend downwardly below the surface of the molten metal and upwardly above the surface of the molten metal, said tubular nozzle being provided with at least one lateral discharge outlet below the surface of the molten metal and said ring being provided with at least one lateral discharge outlet, said ring being rotatable on said nozzle to bring said lateral discharge outlet into register with said lateral discharge outlet of said nozzle, said ring being in threaded engagement with said nozzle from a level above said discharge outlets to a level below said discharge outlets whereby, in the event of fracture of said nozzle within the area of such threaded engagement, the fractured parts of said nozzle are held together by said ring.

3,934,641
COOLING ARRANGEMENT FOR CONTINUOUSLY CAST METAL OBJECTS

Alain Chielens, Marcq-en-Baroeul, France, assignor to Fives-Cail Babcock, Paris, France

Filed Jan. 10, 1975, Ser. No. 539,939
Claims priority, application France, Mar. 20, 1974, 74.09449
Int. Cl.² B22D 11/124
U.S. Cl. 164—283 S 12 Claims



1. A cooling arrangement for a continuously cast metal object comprising:

a. means defining a path of movement for said object, the object having an outer face extending in the direction of said path; and

b. tubular header means for projecting a cooling fluid toward said face, said header means being elongated in a direction substantially parallel to said face and defining a front wall directed toward said face,

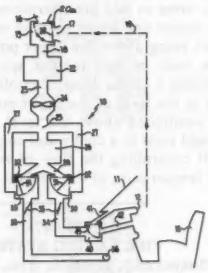
1. said front wall being formed with two rows of first apertures symmetrical to a plane longitudinal relative to said header means and substantially perpendicular to said face,
2. each first aperture having an axis intersecting the axis of an aperture of the other row in said plane,
3. said front wall being further formed with at least one row of second apertures arranged between the rows of first apertures;

c. partition means of said header means bounding a plurality of conduits respectively communicating with said rows of first apertures and said at least one row of second apertures; and
d. a source of air under pressure higher than atmospheric pressure communicating with one of said conduits; and
e. a source of water under pressure higher than atmospheric pressure communicating with another one of said conduits.

3,934,642
VEHICLE AIR CONDITIONING SYSTEM

Derrick Coulson, Crewe, and John C. Coyle, Wybunbury, Near Mantwick, both of England, assignors to Rolls-Royce Motors Limited, Crewe, England

Filed Apr. 8, 1974, Ser. No. 459,234
Claims priority, application United Kingdom, Apr. 13, 1973, 17858/73
Int. Cl.² B60H *3/04*
U.S. Cl. 165—23 **9 Claims**

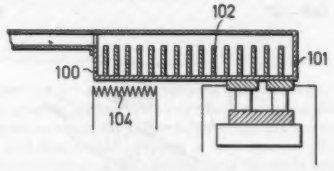


1. A vehicle air-conditioning system for an internal combustion engine driven vehicle comprising:
an air intake,
a refrigerant evaporator connected to the output of said air intake for receiving the air passing into said air intake,
first and second outlet ducting the separately conveying air to respective outlets in the upper and lower parts of the vehicle interior, respectively,
first and second air mixing means respectively selectively connecting said first and second outlet ducting to said heater and said bypass conduit,
means for automatically setting each of said air mixing means to feed to the respective outlet ducting air which has passed through the evaporator and through the heater and/or the heater bypass conduit,
settable mass flow regulating means in at least one outlet ducting,
air temperature sensing means for measuring the ambient temperature and the temperature inside the vehicle,
means responsive to said sensed temperatures for automatically controlling the air mixing means and the mass flow regulating means,
means for closing the outlet or outlets of the second outlet ducting and diverting the entire output of the system to said first outlet ducting,
a manual means for varying the setting of said temperature sensing means, and
control means responsive to engine oil pressure and the energization state of an engine starter motor circuit in said vehicle for maintaining the air-conditioning system deenergized until the oil pressure reaches a predetermined value and the starter motor circuit is deenergized after motor start up, said control means including a relay having contacts which are closed when said oil pressure reaches a predetermined value and after said starter motor circuit is deenergized, said contacts being connected at one end to a power supply and at the other end to said control means.

3,934,643
CONTROLLABLE HEAT PIPE

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen bei Stuttgart, Germany

Continuation-in-part of Ser. Nos. 265,644, June 23, 1972, abandoned, and Ser. No. 289,675, Sept. 15, 1972, abandoned.
This application Feb. 19, 1974, Ser. No. 443,257
Claims priority, application Austria, July 26, 1971, 6455/71; Sept. 17, 1971, 8082/71
Int. Cl. F28d *15/00*
U.S. Cl. 165—32 **10 Claims**



1. A controllable heat pipe formed as a main hollow body having therein a saturated vapor of and a boiling condensate of a liquid and an auxiliary hollow body in gaseous communication with the main hollow body and into which said vapor and condensate may be controllably maintained, a heat sink device in heat conducting contact with said auxiliary body for withdrawing heat from the auxiliary hollow body and a heat source for said auxiliary body for supplying heat thereto; the improvement comprising in that said auxiliary body includes therein a plurality of separate spaces containing said vapor and condensate and in that said heat sink device is positioned near one end of said auxiliary hollow body whereby the spaces within said hollow body progressively nearer to said heat sink device will be exposed to lower temperatures than said spaces progressively further away from said heat sink device.

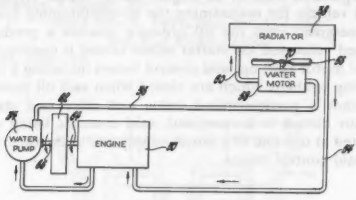
3,934,644
REMOTE ENGINE WATER COOLER

Laird E. Johnston, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1973, Ser. No. 423,882
Int. Cl.² F01P *5/00*
U.S. Cl. 165—51 **1 Claim**

1. A motor vehicle with a liquid cooled engine surrounded by noise insulating material; engine cooling apparatus including air passage means formed between the vehicle roof structure and the ceiling of the vehicle passenger compartment; said air passage means having a forwardly opening air inlet and a rearwardly opening air outlet; a radiator supported within said air passage means in the path of air flowing therethrough; liquid passage means in said radiator for transmitting heat from liquid coolant warmed by the engine to air flowing between said inlet and outlet; conduit means extending from said engine through said noise insulating material and through the walls of said vehicle passenger compartment to said radiator; a water pump operably driven by the vehicle engine in fluid circuit therewith and with said radiator for passing cool-

ant therethrough; a fan located adjacent said radiator for causing air to pass therethrough when vehicle speed is insufficient to cause movement of appreciable quantities of cooling



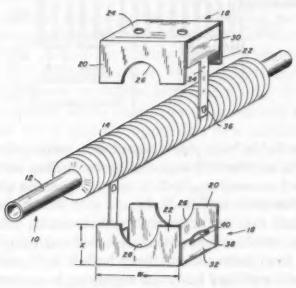
air; hydraulic motor means operably attached to said fan and in circuit with said water pump, said conduits and said radiator for receiving pressurized fluid from the hydraulic motor to rotate said fan.

3,934,645

FINNED TUBE PROTECTOR

Oscar Wesley Butts, Tulsa, Okla., assignor to Yuba Heat Transfer Corporation

Filed Feb. 1, 1974, Ser. No. 438,948
Int. Cl.² B22D *23/00*
U.S. Cl. 165—67 **3 Claims**



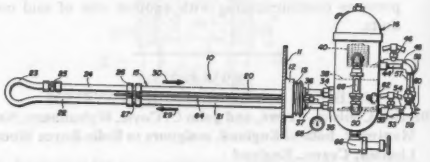
1. In combination with a finned tube including a central tube having a plurality of radially extending fins on the outer periphery thereof, a protector device comprising a pair of substantially identical independent half sections adapted for disposition on the central tube for encasing a plurality of adjacent fins, each of said half sections comprising mutually parallel spaced sidewall means of a substantially rectangular configuration and having a substantially semi-circular recess provided on one edge thereof for engaging the outer periphery of the central tube, outer band means spanning the distance between the sidewall means and disposed at the edge thereof opposite the recess means, first flap means conterminous with one end of the band means and extending substantially perpendicularly therefrom between the sidewall means, second flap means conterminous with the opposite end of the band means and extending substantially perpendicularly therefrom between the sidewall means, an elongated arm member extending outwardly from said first flap means and of a width less than the width of said first flap means, said arm member being engagable with the second flap means of the other half section, and complementary locking means provided on said arm member and second flap means and slidably interengagable for securely snap locking the half sections around the outer periphery of the finned tube as the half sections are moved in directions toward one another with the outer ends of said flap means being spaced apart for providing openings at each end of the protector device installed on the finned tube, said locking means comprising recessed slit means provided on said second flap member for receiving the end of said elongated arm therethrough in a manner substantially precluding accidental seperation of the assembled half-sections.

3,934,646

CONSTANT TEMPERATURE COLD-END CORROSION PROBE

Reed S. Robertson, Glen Ellyn, and William R. Watson, Oaklawn, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Division of Ser. No. 384,072, July 30, 1973, Pat. No. 3,861,876. This application Oct. 10, 1974, Ser. No. 513,870
Int. Cl.² F28D *15/00*
U.S. Cl. 165—105 **2 Claims**



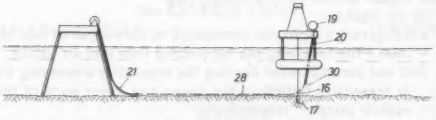
1. Apparatus for cooling a tubular metal corrosion specimen and maintaining the specimen at a predetermined temperature where the specimen is exposed to a gas stream temperature above said predetermined temperature, said apparatus comprising a tank mounted outside the gas stream having a liquid coolant supply therein which has a boiling point substantially the same as said predetermined temperature, vertically spaced upper and lower ports in said tank, the level of liquid coolant being above the upper port, piping connecting the opposite ends of said tubular specimen to said ports thereby defining a probe loop, a cooling coil in said tank substantially at the level of the lower port, a condensing coil in the tank positioned above the level of the liquid, means connecting said coils to a cold water supply, and valve means for each coil controlling the flow of water therethrough to regulate the temperature of the coolant.

3,934,647

PIPE LAYING SYSTEM

Donald G. Bokenkamp, Houston, Tex., assignor to Dolphin International, Inc., Houston, Tex.

Filed June 21, 1974, Ser. No. 481,536
Int. Cl.² E21B *43/01*
U.S. Cl. 166—.5 **21 Claims**



9. A method for connecting an offshore gathering location to at least one peripherally located undersea production well upon completion of the drilling of the well from a drilling structure, comprising the steps of:

unspooling a continuous string of production pipeline from a spool on a drilling structure,

pulling on the free end of said continuous string from another location spaced from said drilling structure while unspooling said continuous string,

extending said continuous string between said drilling structure and said location until the length of said continuous string is such that it will extend from an operating surface of said location to an undersea production wellhead,

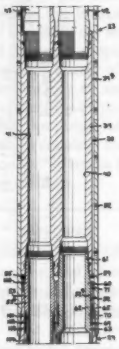
on the drilling structure, connecting wellhead means to the other end of said continuous string of production pipeline, and

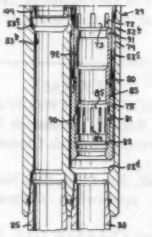
lowering the wellhead means and attached production pipeline from the drilling structure to the undersea wellhead site while pulling on the other end of said continuous string of the production pipeline until the wellhead means is at the undersea production wellhead and the other end of said continuous string is at the operating surface of said location.

3,934,648
WELL TUBING SYSTEM WITH ORIENTING COUPLING MEANS

Amareswar Amancharla, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 18, 1974, Ser. No. 533,807
Int. Cl.² E21B *33/12*; F16L *39/00*
U.S. Cl. 166—116 **16 Claims**



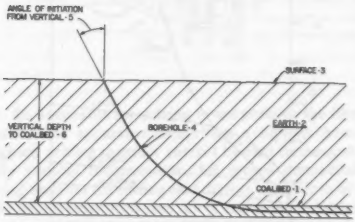


1. A well flow conductor system comprising: first fluid coupling means connectible with a multiple string well packer having a plurality of separate flow passages therethrough, said first coupling means having separate flow passages equal in number and position to communicate with said flow passages in said packer when said first coupling means is connected with said packer; second fluid coupling means adapted to releasably couple with said first coupling means and being connectible with a plurality of separate well flow conductors, said second coupling means having flow passages equal in number and communicating with said first coupling means when said first and second coupling means are connected together; first guide means on said first coupling means; and second guide means on said second coupling means for coacting with said first guide means to rotationally align said second guide means with said first guide means responsive to longitudinal motion only as said second guide means is moved toward said first guide means for coupling said first and second guide means together.

3,934,649
METHOD FOR REMOVAL OF METHANE FROM COALBEDS

Joseph Pasini, III, and William K. Overbey, Jr., both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 25, 1974, Ser. No. 491,726
Int. Cl.² E21B *43/25*; E21C *41/04*
U.S. Cl. 166—254 **8 Claims**



1. A method for removing methane gas from underground coalbeds prior to mining the coal, which comprises determining the orientation of the major natural fracture system of the coalbed and directionally drilling at least one borehole from the earth's surface into the coalbed, said borehole being initiated at a slant and descending at a gradual curve until a horizontal position is reached as the borehole intersects the major natural fracture system of the coal, allowing the methane gas to be released, and recovering the methane gas from the borehole.

3,934,650
RECOVERY OF NATURAL GAS DURING SOLUTION MINING OF AN UNDERGROUND SALT DEPOSIT

Robert G. J. LaFortune, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 316,407, Dec. 18, 1972, Pat. No. 3,856,482, which is a continuation of Ser. No. 172,239, Aug. 16, 1971, abandoned. This application Sept. 23, 1974, Ser. No. 508,253
Int. Cl.² E21B *43/00*
U.S. Cl. 166—267 **1 Claim**

1. The method of recovering natural gas contained in an underground salt deposit, which method comprises:

A. injecting water into said underground salt deposit and contacting the gas-containing salt deposit with injected water, thus obtaining a gas-containing brine solution;

B. withdrawing said brine solution from the underground salt deposit thereby forming brine clouded by very finely divided and substantially uniformly dispersed incipient gas bubbles;

C. passing the clouded brine through a fibrous filter element disposed within a filter zone, said element having a fiber density sufficient to provide a pressure drop for said brine across said filter element of not substantially below about 20 p.s.i.g., and containing in the element natural and synthetic fibers maintained in said filter zone at least in part by resin binding, wherein said fibers are selected from the group consisting of natural wool, cellulose, and rayon, and said fibers are bound together by a synthetic, water-insoluble resin;

D. withdrawing clarified, gas-depleted brine from the downstream region of said filter zone;

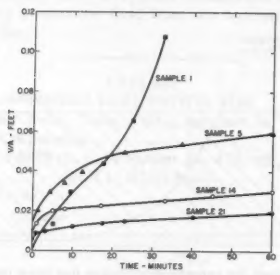
E. withdrawing gas from said filter zone and away from the resulting clarified brine; and,

F. collecting said gas overhead from said filter zone.

3,934,651
METHOD OF ACIDIZING SUBTERRANEAN FORMATIONS

Dale E. Nierode; Donald M. Kehn, and Keith F. Kruk, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 10, 1974, Ser. No. 513,807
Int. Cl.² E21B *43/26*, *43/27*
U.S. Cl. 166—282 **11 Claims**



1. A method of fracturing a subterranean formation which comprises injecting into said formation at a pressure sufficient to form a fracture therein an acid emulsion comprising a major volume proportion of a hydrocarbon liquid as the internal phase and a minor volume proportion of an aqueous acid solution as the external phase, said acid emulsion containing an effective amount of a fluid loss additive comprising finely divided particulate material present in a concentration of at least 2 pounds per barrel of said emulsion; and from about 1 to about 5 weight percent in said acid solution of a polymer mixture of (a) a vinyl polymer for increasing the viscosity of said aqueous acid solution and selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, and copolymers of vinyl alcohol and vinyl pyrrolidone, and (b) a water-soluble natural gum, said natural gum constituting at least 25 weight percent of said polymer mixture.

3,934,652
APPARATUS AND METHOD FOR CEMENTING WELL LINERS

Chudleigh B. Cochran, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Oct. 15, 1974, Ser. No. 514,624
Int. Cl.² E21B *33/14*, *43/10*, *23/00*
U.S. Cl. 166—285 **18 Claims**

7. Apparatus for cementing a liner in a well bore comprising:

a. a setting tool having a tubular mandrel connected in a pipe string for extension through said liner;

b. seal means releasably attached to said liner and sealingly engaging the exterior of said mandrel and the interior of said liner permitting at least limited axial movement of said mandrel without movement of said seal means;

c. said seal means comprising a first sleeve carrying a first annular seal for sealing and sliding engagement with said mandrel and a second sleeve carrying a second annular seal for sealing engagement with said liner;

d. said seal means comprising latch means engageable with corresponding groove means within said liner to releasably hold said seal means against axial displacement therein.

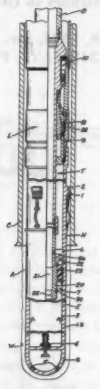
16. A method of cementing a liner in a well bore with a setting tool, having a tubular mandrel, connected to an operating string, comprising the steps of:

a. lowering said setting tool with said liner attached thereabout into said well bore, wiper means sealingly engaging the interior of said liner and seal means sealingly engaging the interior of said liner and the exterior of said mandrel;

b. anchoring said liner in said well bore;

c. releasing said setting tool from said liner;

d. pumping cement into said liner through said operating string and tool mandrel;



e. pumping plug means, sealingly engaging said operating string and mandrel, behind said cement into engagement with said wiper means;

f. pumping said cement out of said liner into said surrounding well bore by forcing said plug means and wiper means through said liner;

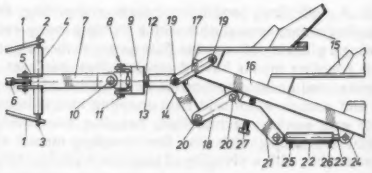
g. releasing said seal means by predetermined non-rotating axial movement of said mandrel; and

h. removing said setting tool and seal means from said well bore.

3,934,653
SEMI-MOUNTED TWO-WAY PLOW

Ignaz Albert Josef Becker, Preussisch Oldendorf, Germany, assignor to Rabewerk Heinrich Clausing, Bad Essen-Linne, Germany

Filed Feb. 25, 1974, Ser. No. 445,138
Claims priority, application Germany, Mar. 2, 1973, 2310497
Int. Cl.² A01B *3/34*, *3/32*
U.S. Cl. 172—212 **19 Claims**



1. Semi-mounted or trailing roll-over plow, comprising:

a rotatable plow part including an elongate frame member, said rotatable plow part further including first and second sets of plow members fixedly mounted upon said elongate frame member and alternately selectable for plowing by rotation of said elongate frame member to corresponding

first and second operating positions, said first and second plow member sets being vertically stacked and horizontally offset from the same side of said elongated frame member in said first and second operating positions, the center of gravity of said rotatable plow part being horizontally offset from said axis of rotation and elongate frame member in both said operating positions due to said horizontal offset of said plow member sets on the same side of said elongate frame member;

means carrying said elongate frame member and having front and rear bearing means for supporting said elongate frame member for rotation about an axis of rotation and longitudinally therebetween;

locating means supportingly interposed between at least one of said front and rear bearings and the adjacent end of said elongate frame member and horizontally shiftably locating said rotatable elongate frame member with respect to said one of said front and rear bearing means for permitting a shift of the center of gravity of said rotatable plow part substantially to said axis of rotation;

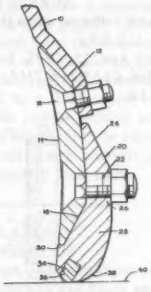
shift means interengaging the locating means with one of said frame member and carrying means adjacent said one bearing means and actuable preparatory to rotation for horizontally shifting said center of gravity of said rotatable plow part substantially to said axis of rotation by sufficient horizontal shifting of the adjacent end of said elongate frame member out of operating position, thereby substantially reducing the vertical lifting and retarding forces required to rotate the rotatable plow part between operating positions.

3,934,654

EARTHWORKING BLADE DEVICE

Earle W. Stephenson, Latrobe, and Leonard E. Toews, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Sept. 6, 1974, Ser. No. 503,957
Int. Cl.² A01B *15/02, 35/26, 1/04;* **E02F** *3/76*
U.S. Cl. 172—719 **13 Claims**



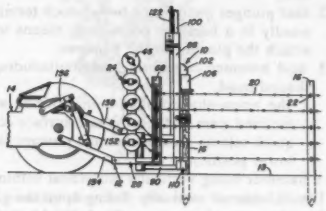
1. An edge member adapted for mounting on the lower part of a blade for a scraping device such as a grader or snow plow so as to extend downwardly from the blade and a fraction of the length of the blade; said edge member comprising a steel body configured to engage one of the forward and rearward sides of the lower part of the blade in face to face engagement therewith, said edge member having a region at the bottom which is thickened in the fore and aft direction, said thickened region being formed with a downwardly opening slot therein, blocks of hard wear resistant material fixedly seated in said slot in side by side relation and having a "V" shaped profile in cross section at the bottom with the apex of the "V" at the bottom, the rearward side of said profile extending substantially horizontally and the forward side of said profile extending upwardly and forwardly to deflect material taken by said edge member upwardly and forwardly.

3,934,655

HYDRAULIC POST SETTING AND WIRE DISPENSING APPARATUS

Bobby A. Whistle, Texarkana, Ark., assignor to Whistle Hydraulics, Inc., Garland, Ark.

Continuation-in-part of Ser. No. 223,136, Feb. 3, 1972, abandoned. This application Jan. 29, 1974, Ser. No. 437,737
Int. Cl.² E04B *17/26*
U.S. Cl. 173—46 **10 Claims**



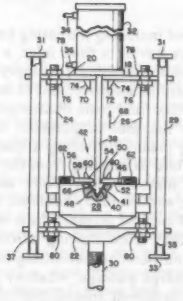
1. An apparatus for driving fence posts or the like into the ground, said apparatus comprising a support framework, a weighted driving member carried by said framework for generally vertical reciprocation, lift means connected to said driving member for raising said driving member to an elevated position and permitting free fall of said weighted driving member to engage the upper end of a post for driving it into the ground, said lift means including a hydraulic motor adapted to be operable in either a motor mode when lifting the driving member or a pump mode when permitting the driving member to free fall, said driving member including an elongated member, said framework including a sleeve slidably guiding said elongated member, an elongated chain mounted alongside of said elongated member and having end portions thereof anchored to respective end portions of the elongated member, drive sprocket means on said hydraulic motor continuously engaged with the chain for moving the chain and elongated member generally vertically when the sprocket means is driven by the hydraulic motor when in a motor mode, said elongated member including a horizontal post engaging member intermediate the ends thereof for engaging the upper end of a fence post.

3,934,656

AUTOMATIC HYDRAULIC HAMMER

Joseph A. Pappert, 140 Myrtle Ave., Turnersville, N.J. 08012

Filed Nov. 1, 1973, Ser. No. 412,019
Int. Cl.² B25D *9/00*
U.S. Cl. 173—124 **8 Claims**



1. In an automatic hydraulic hammer suitable for use with

a hydraulic feed test boring machine having a hydraulic circuit, the combination of

A. a frame defining an interior space,

1. said frame including a top yoke, a bottom support which is vertically spaced the yoke and vertical guides interconnecting the top yoke and bottom support;

B. a hydraulic cylinder connected into the hydraulic circuit and affixed to the top yoke,

1. said cylinder vertically reciprocating a plunger within the space between an upper position and a lower position,

2. said plunger including a body which terminates downwardly in a hammer connecting means to removably attach the plunger to the hammer,

3. said hammer connecting means including an arrow-shaped head,

a. the arrow-shaped head being formed with a lower, inclined, cam surface, the said surface contacting the quick release means when the plunger falls to its said lower position;

C. a hammer being vertically reciprocal within the space,

1. said hammer vertically sliding upon the glides,

2. said hammer being upwardly defined by a top surface;

D. quick release means affixed to the top surface of the hammer to interact with the hammer connecting means for hammer lifting and releasing purposes; and

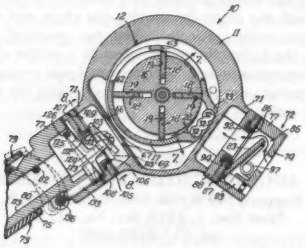
E. clamp release means affixed to the top yoke to function the quick release means when the plunger is urged to its said upper position.

3,934,657

DUAL SAFETY CONTROL MEANS FOR A POWER TOOL

Irvin R. Danielson, Burr Ridge, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed Aug. 1, 1974, Ser. No. 493,922
Int. Cl.² B23B *45/04*
U.S. Cl. 173—169 **12 Claims**



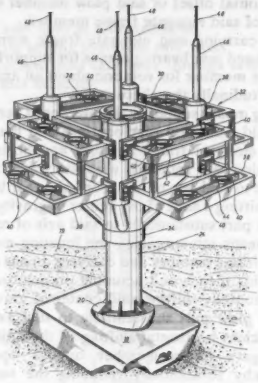
8. In a power tool including a housing having a fluid motor therein, said motor having a fluid inlet, a fluid outlet and a power output member adapted to supply power to a work performing member, the improvement of safety control means for preventing motive fluid from discharging from said motor to rapidly render the tool inoperative, said safety control means comprising means providing a discharge passage for receiving motive fluid exhausting from the fluid outlet of said motor, a control member operatively associated with said discharge passage, and manually actuated means for effecting movement of said control member from a first position preventing motive fluid from flowing through said discharge passage to a second position permitting motive fluid to flow through said discharge passage, whereby said safety control means is operable to permit operation of said motor when said control member is in said second position and to prevent operation of said motor or to rapidly stop the same when said control member is in or moves to said first position.

3,934,658

MODULAR UNDERWATER WELL PLATFORM SYSTEM

Norman A. Nelson, 2422 W. 18th St., Apt. 169, Houston, Tex. 77008

Filed Sept. 19, 1974, Ser. No. 507,182
Int. Cl.² E21B *15/02*
U.S. Cl. 175—7 **15 Claims**



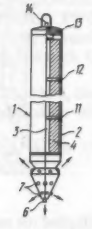
1. A modular underwater well drilling platform comprising, a first guide base adapted to be connected to a well member at the underwater floor, said base including a plurality of connecting and supporting frames directed outwardly in various directions and having interconnecting elements for allowing interconnection with additional guide bases in any of the various directions, said base including an opening for passage of a drill pipe.

3,934,659

APPARATUS FOR DRILLING HOLES IN EARTH SURFACE

Mikhail Ivanovich Tsiferov, ulitsa Druzhinnikovskaya, 11a, kv. 22, Moscow, U.S.S.R.

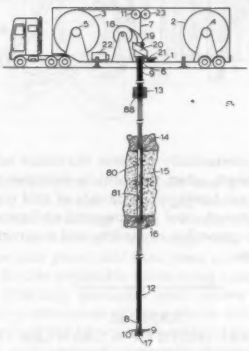
Filed Apr. 15, 1975, Ser. No. 568,183
Int. Cl.² E21B *7/14*; E21C *21/00*
U.S. Cl. 175—14 **8 Claims**



1. An apparatus for drilling holes in earth surface, including a rocket comprising: a generator of gas under high pressure; a drill head situated in the head portion of said rocket and including a group of jet nozzles communicating with said gas generator to create a dynamic gas jet acting on the face of the hole, said group of nozzles including a central nozzle belonging to the longitudinal axis of said rocket and being the hole-face nozzle and a plurality of rows of nozzles belonging to imaginary circles spaced from one another along the longitudinal axis of said rocket, the spacing between any adjacent pair of said rows of nozzles in a projection of sadi drill head upon a plane perpendicular to the longitudinal axis of said rocket being 4 to 7 times greater than the mean diameter of

the nozzles of said adjacent pair of said rows of nozzles, the spacing between any two adjacent nozzles in each row being equal 4 to 7 critical diameters of the nozzles of said respective row.

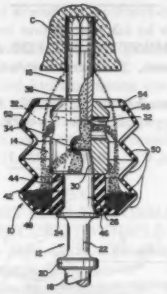
3,934,660
FLEXPOWER DEEP WELL DRILL
Daniel E. Nelson, 4875 Sand Lake Road, Orlando, Fla. 32809
Filed July 2, 1974, Ser. No. 485,231
Int. Cl.² E21B *3/08, 9/32*
U.S. Cl. 175—102 **16 Claims**



1. A well-drilling device having a drill motor, a drill bit attached to a drive shaft of the motor in rotatable contact with the housing of the motor, a drill guide from which the bit is extended in contact therewith from the bottom end thereof, a cable attached to the guide, a hydraulic supply line attached at one end to the motor in inlet port relationship therewith and attached at the other end to a fluid supply source, a cable spool onto which the cable can be wound and unwound to allow the drill guide and bit assembly to be raised and lowered respectively, and an exhaust return conduit attached to the motor in outlet port relationship therewith.

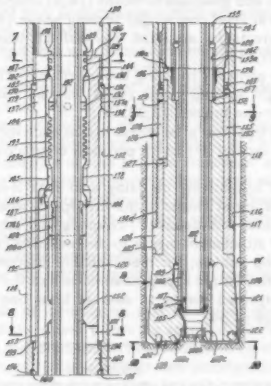
3,934,661
DUST CUP
William D. Sauerwein, Joppa, Md., and Daniel Harrison Sides, New Freedom, Pa., assignors to The Black and Decker Manufacturing Company, Towson, Md.
Filed Aug. 14, 1974, Ser. No. 497,233
Int. Cl.² E21C *7/00*
U.S. Cl. 175—211 **7 Claims**

1. In combination with a self-drilling anchor, a chuck for holding said anchor, an adaptor shank for holding said chuck, and a power tool to drive said shank and chuck and anchor; the improvement comprising a cooperating portion on the adaptor shank located below said chuck and opposite said anchor mounted in said chuck, a dust cup operatively cooperable with said formed portion to hold said dust cup on said formed portion, said dust cup consisting of resilient material and comprising a neck portion adapted to be engaged with said cooperating portion of said shank, an annular wall at the rear end of said neck portion and extending radially outwardly therefrom, a plurality of sidewall portions extending forwardly from the outside of said annular wall and overlying said neck portion and said chuck, and each of said sidewall portions being alternately radially inwardly forwardly and radially



outwardly forwardly disposed, whereby the side of said dust cup is of a bellows-like configuration.

3,934,662
CORE BIT
Alfred R. Curington, and Theodore J. Roscoe, Jr., both of Houston, Tex., assignors to Bakerdrill, Inc., Spartanburg, S.C.
Division of Ser. No. 392,628, Aug. 29, 1973, Pat. No. 3,871,486. This application Oct. 24, 1974, Ser. No. 517,539
Int. Cl.² E21B *9/16;* **E21C** *13/02*
U.S. Cl. 175—405 **7 Claims**



1. An anvil core bit for producing a core in a bore hole in an earth formation, comprising a bit body having an upper anvil portion terminating in an upper transverse face adapted to be struck by an airhammer piston, a bottom drilling face, and a central cylindrical lower opening into which a core can pass, said body further having a central cylindrical passage extending upwardly continuously and longitudinally from said opening and terminating at said upper face, whereby said passage is adapted to receive a core tube, cutter elements secured to said body and extending downwardly from said bottom drilling face for drilling the bore hole laterally outwardly of said opening, core cutting means immovably fixed to said body and disposed about said central opening for cutting the core to a first diameter greater than the diameter of said opening, and cutter means immovably fixed to said body and circumscribing said opening to shape the core to a

final diameter smaller than said first diameter, said cutter means comprising a circumferentially continuous ring coaxial of said body for trimming the core to said final diameter.

3,934,663

ATTACHMENT DEVICE FOR A GAUGE

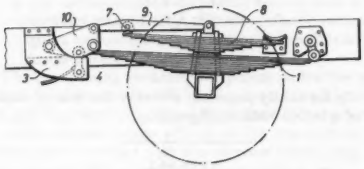
Kurt Ellert Johansson, Timmermangatan 12, S-981 00 Kiruna, Sweden

Filed Jan. 13, 1975, Ser. No. 540,759

Claims priority, application Sweden, Jan. 16, 1974, 7400523

Int. Cl.² G01G *19/08, 3/14*

U.S. Cl. 177—137 **13 Claims**



1. Apparatus for attaching at least one weight sensing gauge (4,34) in a vehicle having a chassis and at least two spring assemblies (1,8) supporting said chassis, such that the at least one weight sensing gauge (4,34) senses the forces transmitted to said at least two spring assemblies (1,8), said attaching apparatus comprising:

at least one bracket (3,33,43) secured to the chassis of the vehicle;

at least one attachment means (10,9) coupled to one end of said at least one weight sensing gauge (4,34) and which is pivotably mounted to said at least one bracket (3,33,43);

means pivotally securing the other end of said at least one weight sensing gauge (4,34) to said chassis via said at least one bracket (3,33,43);

said at least one attachment means each including first (10) and second (9) levers pivotally connected to each other; and

means operatively coupling said first lever (10) of said attachment means to the first spring assembly (1) of the vehicle, and means (7) coupling said second lever (9) of said attachment means to the second spring assembly (8) of the vehicle, for mechanically interpreting the forces applied to the spring assemblies and for transmitting the interpreted forces to said at least one weight sensing gauge (4,34).

3,934,664

STEERING MECHANISM FOR TRACK VEHICLES

Jorma Toivo Tapani Pohjola, Vaskitie 8, 90250 Oulu 25, Finland

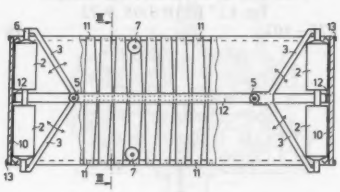
Filed Jan. 31, 1974, Ser. No. 438,191

Claims priority, application Finland, Feb. 1, 1973, 292/73; Feb. 1, 1973, 293/73; Jan. 7, 1974, 40/74

Int. Cl.² B62D *11/00*

U.S. Cl. 180—9.44 **11 Claims**

1. In a vehicle, a pair of end roll means extending transversely of the direction of travel of the vehicle and endless track means extending between and around said pair of end roll means to be guided thereby, said endless track means having a substantially non-stretchable central elongated endless region which is flexible and capable of assuming a curvature in accordance with turns which are executed by the vehicle when at least one of said end roll means turns about an upright axis, said endless track means having on each side of said central elongated region thereof a lateral elongated endless region for automatically contracting when said lateral region is on the inside of a curve executed by the vehicle and expanding when the lateral region is on the outside of a curve executed by the vehicle, said lateral regions of said endless track means automatically expanding and contracting while said central region assumes a curved condition to cooperate with said central region for providing said endless track means



with a smooth, substantially uniform curvature substantially throughout its length when the vehicle executes turns, said endless track means having on each side of said central elongated endless region thereof an elongated endless stretchable sheet material for reversibly expanding and contracting during execution of turns.

3,934,665

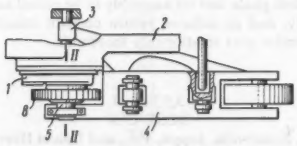
TWO-STEP FINAL DRIVE OF A CRAWLER TRACTOR WITH RUNNING BOGIES

Jury Dmitrievich Egorov, ulitsa Marchenko 17, kv. 4; Ivan Savvateevich Kavyarov, prospekt Lenina, 15, kv. 20; Jury Petrovich Samatov, prospekt Lenina, 22, kv. 30; Nikolai Alexandrovich Chasovodov, ulitsa Marchenko, 19B, kv, 57, and Jury Ivanovich Chirikhin, prospekt Lenina, 28a, kv, 95, all of Chelyabinsk, U.S.S.R.

Continuation of Ser. No. 371,691, June 20, 1973, abandoned. This application July 22, 1974, Ser. No. 490,867

Int. Cl.² B62D *55/00*

U.S. Cl. 180—9.62 **3 Claims**



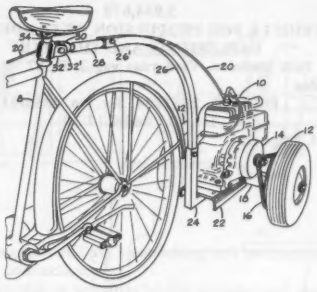
1. A two-step final drive of a crawler tractor provided with track roller frames, comprising a tractor frame; a carrier of a planetary reducer of a tractor transmission, said carrier being secured to said frame; a body disposed on one side of said carrier; a pinion supported by bearings in said body; a shaft of the tractor transmission, said shaft being linked up with said pinion through a splined connection; a driven gear supported by bearings in said body and meshing with said pinion; planet gears supported by bearings on said carrier; a sun gear meshing with said planet gears and connected to said driven gear by splines; said carrier being provided with a free end; a pivot for a track roller frame of the tractor, said pivot being disposed at said free end of the carrier; a track sprocket disposed at said free end between said pivot and the planetary reducer; and a ring gear linked up with said track sprocket by a splined connection and meshing with said planet gears.

3,934,666

BIKE BOOSTER

Robert W. Ellington, 4414 Concho St., Dallas, Tex. 75206

Filed Jan. 2, 1974, Ser. No. 429,493
Int. Cl.² B62P 59/04
U.S. Cl. 180—11 7 Claims



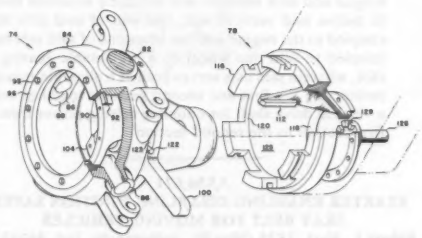
1. The combination of a bicycle and a rear independent booster unit, with means connecting the booster unit to the bicycle and an attaching joint, wherein the improvements comprise: in the booster unit a single axle brace fixed to a single motor base piece, said base piece providing support and fixity for a double adjustable telescoping connecting means to which an attaching universal joint allows complete unrestricted rotary movement of the booster unit with relation to the bicycle, or of the bicycle with relation to the booster unit, about three mutual closely perpendicular axes.

3,934,667

ARTICULATED VEHICLE COUPLER

Daniel M. Schwartz, Los Altos, and John W. Cross, San Jose, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed July 1, 1974, Ser. No. 484,873
Int. Cl.² B62D 59/00
U.S. Cl. 180—14 A 11 Claims



1. Coupler apparatus for joining first and second sections of a ground vehicle comprising

a socket forming member adopted to be attached to said first section,

an insertion means adopted to be attached to said second section, said insertion means complementary with and receivable in said socket member,

said insertion means including a forward semi-spherical support surface and a rearward larger diameter cylindrical support surface,

a guide receptacle defined by a pair of tapered walls in said insertion means,

a guide projecting from said socket forming member, said guide cooperating with the tapered walls of said guide receptacle to assist in angularly aligning said insertion means and said socket member,

first set of final alignment members on the said socket member,

second set of final alignment members on the said insertion means, said first and second set of alignment members meshing for providing final alignment of said insertion means and said socket member,

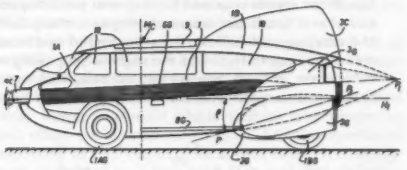
locking means, said locking means cooperating with said first set of final alignment members and said second set of final alignment members for rigidly attaching said insertion means and said socket member.

3,934,668

LIGHTWEIGHT HIGH PERFORMANCE, HIGH SECURITY VEHICLE

Jacques Jean-Marie Jules Gerin, Chatellenot, Pouilly-en-Auxois, Cote d'Or, France

Filed Nov. 20, 1973, Ser. No. 417,544
Claims priority, application France, May 5, 1972, 72.16157
Int. Cl.² B62D 61/00
U.S. Cl. 180—21 5 Claims



1. A lightweight high performance vehicle affording a great degree of security comprising

a tapered cockpit with a well rounded forward portion both in the horizontal and in the vertical plane;

a profiled transverse horizontal appendix extending from both sides of the rear of said cockpit;

two front wheels at the front portion of said cockpit;

two rear wheels detached from said cockpit and housed at the two extremities of said profiled transverse appendix and forming therewith a transverse horizontal stabilizer;

three vertical stabilizers forming fins disposed respectively above said cockpit and at the two extremities of said transverse stabilizer;

and an aerodynamic brake including

a transverse pin located at the rear of said horizontal appendix,

flaps capable of pivoting on said transverse pin, under control of the driver, when the speed of the vehicle is sufficient for aerodynamic brake action to be efficient,

additional flaps contained inside said aerodynamic brake flaps and capable of pivoting laterally and automatically in proportion as said brake flaps pivot towards their fully open position so that, when the latter is reached, the space between said brake flaps and said central fin disposed above said cockpit is substantially completely blocked by said additional flaps.

3,934,669

POWERED VEHICLE

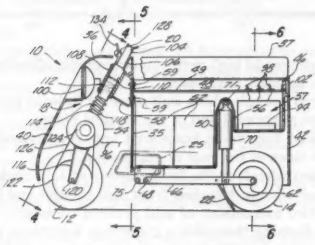
Herbert L. Adams, 1036 San Carlos Road, Pebble Beach, Calif. 93953

Filed Aug. 26, 1974, Ser. No. 500,389
Int. Cl.² B60K 17/30; B62D 9/00
U.S. Cl. 180—34 2 Claims

1. A powered vehicle comprising:

an integrally formed body frame, resembling a suitcase, bounded by a top wall, a front wall, a rear wall, and side walls;

a pair of wheels supporting said frame;
a steering column having a lower portion rotatably carried by said frame, said lower portion of said steering column being coupled to one of said wheels to facilitate the steering of said vehicle when said steering column is rotated with respect to said frame;
an upper portion of said steering column being longitudinally slidably received in said lower portion and movable between a raised position and a lowered position;
means for releasably securing said upper portion to said lower portion when in either said raised or lowered positions, such that said upper portion of said steering column is rotatable with said lower portion when said upper portion is in said raised position and releasably secured with said lower portion, and said upper portion is movable with respect to said lower portion when not secured to said lower portion;
handlebar means carried by said upper portion and movable with said upper portion to a front to rear position with respect to said vehicle such that one end of said handlebar means is in close proximity to said top wall of said frame when said upper portion of said steering column is in said lowered position; and
the other end of said handlebar means projecting outwardly from said front wall of said vehicle, whereby, when said handlebar means is in said front to rear position, said one end of said handlebar means serving as a means for lifting and carrying said vehicle, the other end of said handlebar means serving to facilitate the manual propelling of said vehicle on at least one of said wheels; said handlebar means are coupled with said steering column by a non-



circular arrangement for positioning said handlebar in 90° increments for fail-safe torsional coupling for steering said vehicle in said operative mobile condition and for acurate positioning of said handlebar means with respect to said steering column in said front to rear position.

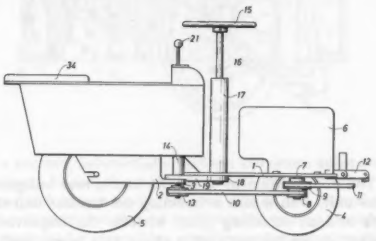
2. An electrically powered vehicle comprising:
an integrally formed body frame;
a plurality of wheels supporting said frame including a front driven wheel;
a steering column carried by said frame having an upper and a lower portion;
an electric motor carried by said steering column;
an angled member having a base and means for mounting an axle on which said driven wheel is rotatably mounted and supported, said base of said member mounting said electric motor;
means connecting the mechanical output of said electric motor to said wheel to drive the same; and
means fixedly attaching one end of said lower portion of said steering column to said electric motor such that said front driven wheel, said angled member, said electric motor, and said lower portion of said steering column unitedly form one member adapted to facilitate the steering of said electrically driven wheel;
bearing means carried by said frame and rotatable with respect to said frame, said bearing means having a splined bore, the opposite end of said lower portion of said steering column having a splined portion slidably received within said splined bore; and
shock absorbing spring means carried by said lower portion of said steering column and engaging with a portion of said frame.

3,934,670

VEHICLE FOR PROPULSION OF GARDENING IMPLEMENTS AND THE LIKE

Thord Erik Medalen, Vindarnas vag 2, S-582 72 Linkoping, Sweden

Filed Feb. 25, 1974, Ser. No. 445,691
Int. Cl.² B60K *17/30*
U.S. Cl. 180—52 **2 Claims**



1. In a vehicle for the propulsion and operation of gardening, road-sweeping, snow-clearing and the like implements, said vehicle including first and second wheeled sections, the first section having an engine mounted thereon and the second section having at least one wheel adapted to be driven by the engine, means for pivotally connecting the first and second sections for articulated steering movement about a vertical axis, steering means mounted on one of the sections for implementing said steering movement, and a drive train extending between the sections for drivably coupling the engine to said one wheel, the improvements characterized by:
the means for pivotally connecting including a fork member extending from one of the sections and a tongue member extending from the other section and interposed in the fork member, and a vertical axle extending through the tongue and fork member and rotatably mounted therein to define said vertical axis, one end of said axle being coupled to the engine and the other end of said axle being coupled to said one wheel by a regulatable gearing device, wherein said axle serves both as a pivot pin rotatably connecting the first and second sections together and as a vertical drive shaft for coupling driving power from the first section to the second section.

3,934,671

STARTER ENABLING-DISABLING IGNITION SAFETY SEAT BELT FOR MOVING VEHICLES

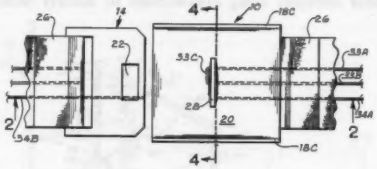
Robert L. Hart, 1525 Olive St., Indianapolis, Ind. 46203

Filed Oct. 10, 1974, Ser. No. 513,476
Int. Cl.³ B60R *21/02*
U.S. Cl. 180—82 C **4 Claims**

1.
A seat belt buckle means providing a connection means for establishing one or more circuits as an incident to the establishing of the mechanical supporting connection of the buckle means, and comprising:
first and second co-operating buckle members releasably engageable for establishing the mechanical supporting connection of the buckle means;
co-operating optical conductor means on each of the buckle members, the respective optical conductor means being optically connected to and providing a portion of an associated opto-electrical circuitry, said optical conduc-

tor means being respectively operatively aligned with the buckle member components which establish the mechanical supporting connection, and thereby operatively aligned for co-operating with one another whenever and only whenever the said buckle members are co-operatively engaged and are establishing said mechanical supporting connection; and

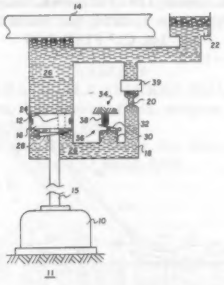
a key receivable in said first buckle member and including a portion of said optical conductor means therein, and removable from said buckle member to disable said opto-electrical circuitry.



3,934,672
METHOD AND APPARATUS FOR SENSING WHEN A SEISMIC GAS EXPLODER IS IN CONTACT WITH THE EARTH

Daniel P. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 25, 1974, Ser. No. 526,841
Int. Cl.² G01V 1/06
U.S. Cl. 181—117 **13 Claims**



4. In a system for generating seismic energy by means of a gas exploder of the type adapted to apply a downwardly directed pulse to the earth and which is driven upwardly by the resultant reactive force, the improvement comprising:

a a support structure,

b a hydraulic cylinder fixed to said support structure and having a piston movable therein,

c a quantity of hydraulic fluid in said cylinder,

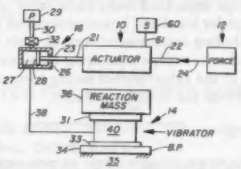
d means for coupling said gas exploder to said piston so that the weight of said gas exploder is exerted through said piston during the fall of said exploder to increase the pressure in said fluid, and

e means for sensing the pressure in said fluid to determine when said pressure increase has been relieved by the return of said exploder to earth.

3,934,673
VIBRATOR SYSTEMS FOR GENERATING ELASTIC WAVES IN THE EARTH

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Continuation-in-part of Ser. No. 223,896, Feb. 2, 1972, Pat. No. 3,789,951. This application Feb. 1, 1974, Ser. No. 438,698
Int. Cl.² G01V 1/14
U.S. Cl. 181—119 **17 Claims**



1. A vibrator system for generating seismic waves in the earth, comprising;

a. at least one vibrator comprising a first expandable closed chamber having two parts which reciprocate with respect to each other, one part in contact with the earth, and the other part connected to a reaction mass;

b. an actuator drive means controlled in accordance with an oscillatory drive signal and having an output drive means responsive to said drive signal;

c. a first compartment comprising an expandable closed cavity having two parts which oscillate with respect to each other, the internal volume of said first compartment responsive to said output drive means, said first compartment connected by a first conduit to said first chamber, said first chamber and said first compartment filled with pressurized fluid at a selected pressure P;

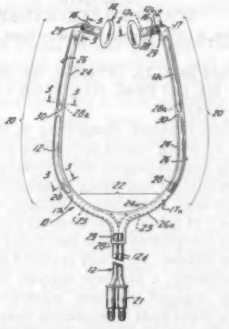
d. said fluid at pressure P in said first compartment creating a first force F1 acting against said actuator output drive means; and

e. passive means to exert a second force F2 on said actuator output drive means in opposition to and substantially equal to the time average value of said force F1 on said drive means exerted by said fluid in said first compartment.

3,934,674
ACOUSTIC HEADSETS

Sidney X. Shore, 29 Wren Drive, Roslyn, N.Y. 11576, and Paul S. Martin, 189-54 43rd Road, Flushing, N.Y. 11358

Filed Aug. 29, 1974, Ser. No. 501,688
Int. Cl.² A61B 7/02
U.S. Cl. 181—135 **5 Claims**



1. An acoustic headset having a pair of sound-transmitting tubes, a pair of earpieces carried by respective first end por-

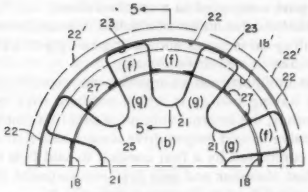
tions of said tubes, and a generally U-shaped frame having in-turned end portions containing and directing second portions of said tubes adjacent first end portions thereof, said frame further including resilient arms containing third portions of said tubes extending from said in-turned end portions thereof, said frame further including a central portion carrying said arms, and a plug-in terminal, said tubes each including a further length extending to said plug-in terminal from said third portions thereof, respectively, said arms having inner and outer strips separated from each other along their entire lengths except for localized interconnections at widely spaced locations including interconnections at their extremities, and said inner and outer strips extending along said third portions of said tubes at the sides thereof facing toward and away from the center-line of the U-shaped frame.

3,934,675

JET ENGINE NOISE SUPPRESSOR

William P. Lear, Verdi, Nev., assignor to Lear Avia Corporation, Reno, Nev.

Filed May 20, 1974, Ser. No. 471,476
Int. Cl.² F02K 1/26
U.S. Cl. 181—33 HC **15 Claims**



1. A sound suppressor for a jet engine having an exhaust nozzle through which hot exhaust gases are thrust along its longitudinal axis from the engine, said sound suppressor, comprising:

a plurality of mixing channels arranged about the downstream exit of the exhaust nozzle receiving both the exhaust gases and cooling air for directing cool air into the peripheral regions of the exhaust gas flow, thereby effectively attenuating the sound output, said channels having respective channel walls extending into the peripheral region of the exhaust gas flow, each channel wall having a surface configuration perpendicular to the inside surface of the exhaust nozzle and parallel to the direction of the longitudinal axis.

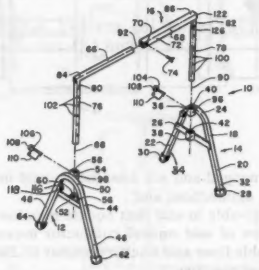
3,934,676

SCAFFOLD STRUCTURE

Robert C. Rice, 6137 Lincoln Highway East, Fort Wayne, Ind. 46803

Filed Sept. 23, 1974, Ser. No. 508,525
Int. Cl.² E04G 1/32; F16M 11/00
U.S. Cl. 182—182 **10 Claims**

1. A scaffold structure comprising at least two rigid leg frames, each set of leg frames including a pair of spaced-apart legs and a top portion, upper collar elements each having an opening therethrough and being secured to said top portion with said openings extending vertically, a platform frame including a pair of parallel spaced-apart post members having cross-sections complementary to said collar openings whereby said posts are slidably, vertically received through said upper collars, respectively, a platform support including a pair of telescopically engaged platform members fixedly secured adjacent their distal ends to respective ones of the upper ends of said post members, post locking means for locking said posts in selected vertically displaced positions to said collar members with said platform members extending laterally between said leg frames in a plane generally perpendicular to the plane including said legs, support locking means for locking said support members in selected telescopically extended positions, a storage collar element fixedly secured to each of said leg frames, each said storage collar element having an opening therethrough, said openings having an axis disposed generally parallel to a plane including said legs, said storage collar openings being dimensioned to slidably receive said



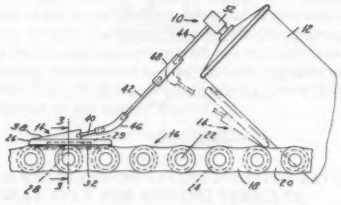
posts therethrough, the outer one of said platform members being open at both ends thereof, the inner one of said platform members being slidably receivable into either end thereof, whereby said leg frames can be vertically stacked in interlocking relationship upon one another, said platform support can be assembled with said posts in closely spaced-apart relationship with said posts being slidably received in said storage collar elements.

3,934,677

MAGNET FOR GUIDING LUBRICATING HEAD ON A CHAIN TO BE LUBRICATED

Roger A. Schott, 13559 Rutland, Detroit, Mich. 48227, and Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223

Filed June 6, 1974, Ser. No. 477,311
Int. Cl.² F16N 7/00
U.S. Cl. 184—15 R **8 Claims**

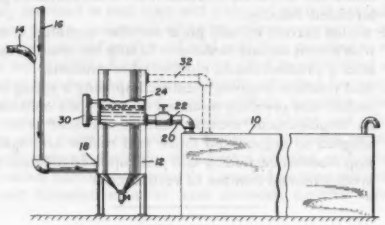


2. A lubricator for a chain having a plurality of links pivotally interconnected adjacent their ends comprising an applicator head, a guide carried by said head and aligning said head with a chain for relative longitudinal movement therebetween, a magnet carried by said head for retaining said head on a chain in alignment therewith during relative longitudinal movement between said head and a chain, and means forming a passageway carried by said head for a lubricant to be discharged onto a chain for lubricating a chain, said magnet being a permanent magnet having a pair of spaced apart longitudinally extending parallel side walls projecting from said head into the space between and lying closely adjacent opposed transversely spaced apart links of a chain when said head is received thereon, thereby providing at least a portion of said guide carried by said head.

3,934,678
FLOW MONITOR FOR CIRCULATING LUBRICATION SYSTEMS

Lewis C. Jennings, Boylston, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Mar. 4, 1974, Ser. No. 447,900
Int. Cl.² F01M 11/12
U.S. Cl. 184—103 R 6 Claims



1. In an apparatus for circulating lubricating systems comprising a main receiving tank containing lubricant which is circulated through part of the system under pressure and unpressurized drain lines for returning the lubricant to the main receiving tank for recirculation, the improvement which comprises:

a. an indicating tank for receiving lubricant from said unpressurized drain lines, said indicating tank having a horizontal cross-sectional area which is substantially less than the horizontal cross-sectional area of said main receiving tank at any fluid level;

b. level indicator means for indicating the level of lubricant in the indicator tank, said level indicator means operatively connected to said indicating tank;

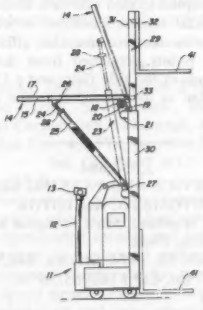
c. drain line means for draining lubricant by gravity flow from said indicating tank into said main receiving tank; and,

d. valve means located along said drain line means for maintaining a substantially constant fluid level in said indicating tank during ordinary operating conditions.

3,934,679
RETRACTABLE STACKER GUARD

Nathan S. Lieptz, Beachwood, Ohio, assignor to Curtis Noll Corporation, Cleveland, Ohio

Filed Oct. 21, 1974, Ser. No. 516,363
Int. Cl.² B66B 9/00
U.S. Cl. 187—1 R 15 Claims

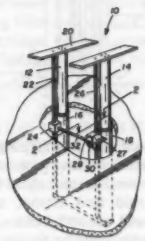


14. In a protective overhead guard for an operator-controlled vertical load-lifting machine having a longitudinally movable vertical-lifting member, the combination of an overhead guard pivotally connected to said machine for angular displacement relatively thereto, first means associated with said overhead guard and cooperating with said member for raising said guard axially about said pivotal connection to a retracted substantially upright position in response to downward longitudinal motion of said member to a load-carrying position below the operator, and second means associated with said guard and cooperating with said member for lowering said guard axially about said pivotal connection to an operator-protective position in response to upward longitudinal motion of said member toward a load-carrying position above the operator.

3,934,680
SAFETY LATCH FOR AUTOMOTIVE HOISTS OR THE LIKE

Burton DeWolfe Bishop, Salisbury, Md., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 26, 1975, Ser. No. 553,366
Int. Cl.² B66F 7/28
U.S. Cl. 187—8.5 5 Claims



1. Improved safety latch apparatus for automotive hoists or the like that includes a piston telescopingly arranged within a fixed cylinder and means for causing said piston to move relative to said cylinder, said latch apparatus comprising:

a rack gear attached to and movable with the piston;

a latch housing attached to the cylinder and encompassing a portion of said rack gear, whereby said rack gear can move through said housing upon movement of said piston;

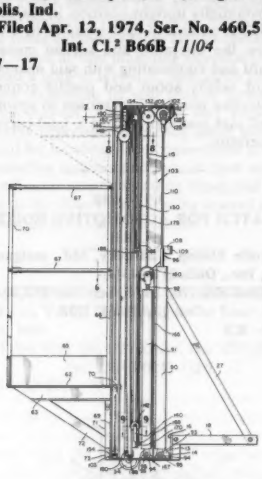
a gear shaft journaled in said housing;

a spur gear attached to said gear shaft in mesh with said rack gear, whereby said spur gear and shaft rotate in response to movement of said rack gear through said housing;

a latch dog member pivotally supported by said housing and including a tooth portion that is engageable with said rack gear; and,

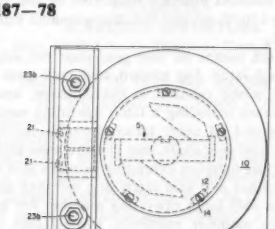
friction-clutch means on said gear shaft for automatically urging said latch dog toward said rack gear when the piston is raised relative to the cylinder, said friction-clutch means including a latch operating member movable with and, at other times, movable relative to said spur gear and gear shaft, said clutch means also including a connecting member extending between said latch operating member and said latch dog member and resilient means on said latch operating member for biasing said latch dog member relatively toward said rack gear, whereby movement of said operating member moves said latch dog member into or out of engagement with said rack gear to prevent or permit movement of said rack relative to said housing, said resilient means permitting movement of said dog member relatively away from said rack gear permitting relative upward movement of said rack gear relative to said housing when said latch dog member is engaged with said rack gear.

3,934,681
OVERHEAD SERVICE UNIT
Robert C. Herrell, Indianapolis, Ind., assignor to Baker-Roos, Indianapolis, Ind.
Filed Apr. 12, 1974, Ser. No. 460,510
Int. Cl.² B66B *11/04*
U.S. Cl. 187—17 11 Claims



1. An overhead service unit, comprising a base, a first frame fixedly mounted on said base and projecting upwardly therefrom, a plurality of second frames slidably interconnected to each other and to said first frame, a platform movably mounted on one of said second frames, a pair of cylinders mounted on said base and each having an upwardly projecting vertically movable ram, a plurality of sets of chains operatively connected to said base, first and second frames, platform and rams whereby upon actuation of said cylinders to extend one of said rams and retract the other of said rams said chains will cause said second frames and platform to move vertically with and with respect to each other, and means for selectively actuating said cylinders to move said rams with respect to each other.

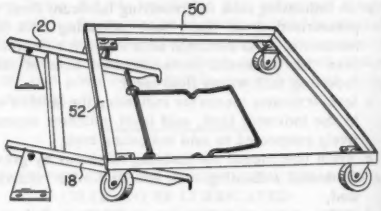
3,934,682
SAFETY DEVICE FOR LIFTS, HOISTS AND LIKE APPARATUS
Ture E. Hedstrom, Tjadervagen 35, 141 72 Huddinge, Sweden
Filed Nov. 5, 1973, Ser. No. 412,732
Claims priority, application Sweden, Dec. 13, 1972, 15279/72
Int. Cl.² B66B *5/18*
U.S. Cl. 187—78 4 Claims



1. A safety device for braking a hoist and the like to a stop when its downward movement in a frame structure reaches a predetermined rate of descent, comprising:

a. a plate member fixed to the frame structure of said hoist having a sleeve member within which a shaft is journalled to rotate with the movement of the hoist;
b. a brake disc mounted to rotate about said sleeve in frictional engagement with stationary friction means effective to brake the descending movement of the hoist;
c. centrifugal means connected to said shaft and responsive to the rotational speed thereof to engage and rotate said brake disc when the rotation of the shaft reaches a predetermined velocity;
d. means carried by said plate member mounted to co-act with means on said brake disc to stop the rotation thereof after a predetermined number of revolutions;
e. said rotation stopping means comprising a spring biased rocker arm pivotally mounted on said plate member and an impingement member carried by said brake disc adapted to engage and move said rocker arm against a stop member carried by said plate upon completion of the predetermined number of revolutions.

3,934,683
LOCKING BRACKET FOR DOLLY
Ronnie H. Walker, Cypress, Calif., assignor to Banner Metals, Compton, Calif.
Filed Jan. 20, 1975, Ser. No. 542,563
Int. Cl.² B60T *3/00*
U.S. Cl. 188—32 2 Claims

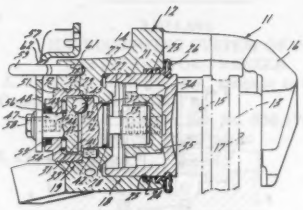


1. A locking bracket assembly for a dolly, or the like, comprising: a pair of pedestals to be mounted on a horizontal supporting surface in spaced positions along an axis adjacent and parallel to a wall, or the like; a pair of side rails respectively pivotally mounted on said pedestals at points displaced from the centers thereof toward the forward ends of the rails and with the forward ends of the rails spaced a predetermined distance from the wall surface, said side rails assuming a normally inclined position with the rear ends thereof resting on the horizontal supporting surface and with the forward ends thereof displaced up from the horizontal supporting surface; and a foot pedal coupled to said side rails to turn said rails to a generally horizontal release position, in which said foot pedal comprises a wire-like cross member affixed to said side rails at respective points displaced from the pivot points towards the rear ends of the side rails; and a U-shaped member pivotally coupled at its open end to the wire-like cross member.

3,934,684
COMBINED SERVICE AND PARKING BRAKE WITH AUTOMATIC ADJUSTOR
Anthony C. Evans, Westland, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Feb. 28, 1974, Ser. No. 446,735
Int. Cl.² F16D *65/56*
U.S. Cl. 188—71.9 3 Claims

2. A sliding caliper type disk brake comprising a caliper housing having first and second portions adapted to be disposed contiguous to respective braking surfaces of an associated disk brake rotor, a cylinder bore formed in said first caliper portion, a piston slidably supported in said cylinder

bore and adapted to cooperate with a first brake pad, means for pressurizing said cylinder bore and uring said piston toward the associated rotor braking surface to actuate the associated brake pad and for creating a reactive force for sliding said caliper assembly axially relative to the associated brake rotor, said cylinder bore terminating at an integral wall of said first caliper portion, a bore extending through said wall and terminating at an opening formed integrally with said first caliper portion, an actuating member having a first portion slidably received in said bore and a second portion extending into said piston, automatic adjusting means operatively connecting said second portion of said actuating member to said piston for actuating said piston upon axial movement of said actuating member and for automatically adjusting for wear of at least the first brake pad, said automatic adjusting means comprising a housing received within said piston and affixed against axial movement relative thereto, a threaded member rotatably supported within said adjustor housing, said actuating member having an externally threaded portion extending into said threaded member, said threaded member having



internal threads engaged with the threads on said actuating member, said threaded member having external threads of different pitch from said internal threads, a drive ring positioned within said adjustor housing and having a threaded connection with said external threads of said threaded member, means for transmitting axial force exerted upon said adjustor housing into a force acting upon said ring for effecting a differential screw rotation of said threaded member and one-way brake means operatively interposed between said threaded member and said housing for limiting the degree of reverse movement of said threaded member upon return brake action in response to a predetermined degree of lining wear, seal means interposed between said bore and said actuating member for preventing the leakage of fluid from said cylinder bore through said bore into said opening, rotary cam means disposed within said caliper opening, an operating member rotatably supported by said first caliper portion and operably connected to said rotary cam means for axially moving said actuating member upon rotary movement of said operating member to mechanically actuate said piston.

3,934,685

WHEEL SPEED SENSOR ASSEMBLY

Raymond John Jovick, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1974, Ser. No. 520,283

Int. Cl.² B60T 8/12

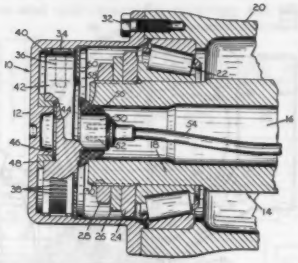
U.S. Cl. 188—181 R **10 Claims**

1. An improved wheel speed sensor assembly for installation in association with a wheel rotatably mounted on a hollow axle which has an open-ended spindle and being of a type which includes an excitor ring mounted within a hub cap of said wheel and a magnetic sensor device capable of electrically transmitting a speed signal through electrical wiring extending through the interior of said axle; wherein the improvement comprises:

said sensor device being disposed within a sensor housing;

said sensor housing being disposed within said hub cap and mounted thereon for relative rotation about a central axis of said hub cap with said sensor device in alignment with said excitor ring;

said sensor housing having a connector portion generally extending toward and aligned with said open-ended spindle and electrically coupled to said wiring when said hub cap is secured on said wheel; and



means disposed between said spindle and said sensor housing for providing frictional contact therebetween to prevent relative rotation of said spindle and said sensor housing during operation of said assembly.

3,934,686

CARBON FRICTION MEMBERS HAVING TORQUE TRANSMITTING FORMATIONS

Ian Leonard Stimson, Rugby, and Frederick Sidney Dowell, Coventry, both of England, assignors to Dunlop Limited, London, England

Filed Dec. 18, 1973, Ser. No. 425,801

Claims priority, application United Kingdom, Dec. 20, 1972, 58890/72

Int. Cl.² F16D 69/02

U.S. Cl. 188—251 A **10 Claims**

1. A carbon frictional member for a brake or clutch comprising an annular carbon disc one periphery of which is provided with a number of discrete circumferentially-separated carbon torque-transmitting formations reinforced by filamentary material, the formations being formed by a separate sequence of operations from those used to form the remainder of the friction member and recessed into the periphery so that the disc surrounds the inserts on all but their radially outer faces.

3,934,687

HYDRAULIC COUPLING FLUID CLUTCHES

John Edward Becker, Bowmanville, Canada, assignor to Cluaran Associates Ltd., Oshawa, Canada

Filed Aug. 19, 1974, Ser. No. 498,672

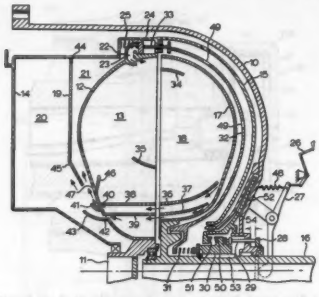
Claims priority, application United Kingdom, Aug. 22, 1973, 39711/73

Int. Cl.² F16D 67/00

U.S. Cl. 192—3.23 **8 Claims**

1. A hydraulic coupling fluid clutch comprising co-operating pump and turbine elements each having radial vortex-producing vanes and forming a working chamber, a reservoir chamber carried by the pump or turbine element, said reservoir chamber comprising two separate compartments connected by flow means, means for feeding the liquid from the

working chamber separately to the two compartments of the reservoir chamber, the said feeding means feeding liquid to one compartment under normal operating conditions of the coupling and feeding liquid to the other compartment under stall operating conditions, valve means returning liquid from the reservoir chamber to the working chamber, the said valve



means connecting the said one compartment and the working chamber, and the said flow means between the compartments being of less flow capacity than the means feeding liquid to the other compartment, and operator-controlled means for closing the valve means to retain the liquid in the reservoir chamber and thereby declutch the coupling.

3,934,688

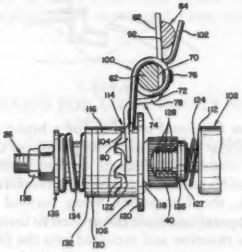
SHIFTER MECHANISM

Daniel Harrison Sides, New Freedom, Pa., and William D. Sauerwein, Joppa, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 11, 1974, Ser. No. 505,042

Int. Cl.² F16D *47/00*, *7/02*, *11/04*

U.S. Cl. 192—48.5 **32 Claims**



20. In an electrical tool, the combination comprising a motor shaft, a transmission driven by said shaft, clutch means interconnecting said shaft and said transmission, said clutch means comprising a first clutch member rotatably and slidably mounted on said shaft and a second clutch member, means to locate said second clutch member in a predetermined axial position on said shaft and for rotation with said shaft, spring means for urging said first clutch member into engagement with said second clutch member, said first clutch member comprising a pinion portion engaged with said transmission and a flange portion, shift means cooperable with said flange portion to move said first clutch member axially on said shaft and out of engagement with said second clutch member, said shift means comprising a shift member rotatably mounted in the housing of said tool and having a first portion cooperable with said flange portion of said first clutch member, said shift member having a second portion, said shift means further comprising an operating member mounted for motion in said housing, and spring means for urging said shift member second portion into engagement with said operating member, whereby a predetermined motion of said operating member causes a corresponding motion of said shift member which in turn moves said first clutch member into or out of engagement with said second clutch member.

3,934,689

SYNCHRONIZATION MECHANISM FOR CHANGE-SPEED TRANSMISSIONS OF MOTOR VEHICLES

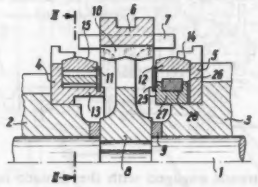
Emil Kunz, Kornwestheim, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed Apr. 8, 1974, Ser. No. 459,122

Claims priority, application Germany, Apr. 10, 1973, 2317852

Int. Cl.² F16D *11/00*

U.S. Cl. 192—53 C **28 Claims**



1. A synchronization mechanism, especially for change-speed transmissions of motor vehicles, in which a slotted synchronizing ring means is under the influence of slotted, substantially ring-shaped blocking means increasing the servo-effect thereof, the blocking means being arranged between the synchronizing ring means and a hub of an associated coupling means, characterized in that the blocking means is supported during a synchronizing operation at an independent abutment means extending in a recess means provided in the hub of the coupling means, the abutment means being engaged in a groove in the hub of the coupling means and being effectively anchored together with the blocking means between the ring ends thereof and the abutment means being loosely guiding in the blocking means such that a minor relative movement of said blocking means with respect to said abutment means takes place during synchronizing operations.

3,934,690

MAGNETIC SPRING CLUTCH

John L. Janning, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 4, 1974, Ser. No. 529,316

Int. Cl.² F16D *19/00*

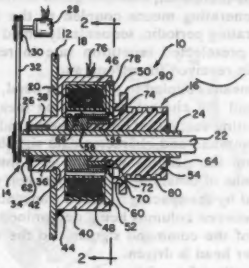
U.S. Cl. 192—84 T **13 Claims**

1. In a magnetic spring clutch having a driving member means; a coil means, an output member means, and a helical clutch spring having one end fixed to said driving member means to rotate therewith; the improvement comprising:

a floating magnetic ring fixed to said output member means with said magnetic ring being at least partially surrounded by said clutch spring;

said coil means when energized having a magnetic flux path which passes through said clutch spring and said magnetic

ring so as to cause said clutch spring to tighten on said magnetic ring to provide a driving connection between

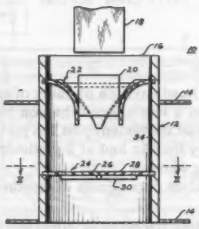


said driving member means and said output member means.

3,934,691
ICE DISPENSING SYSTEM OF A REFRIGERATOR-FREEZER

Henry A. Toloczko, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 6, 1974, Ser. No. 530,175
Int. Cl.[2] B65G 11/20
U.S. Cl. 193—32 6 Claims



1. In an ice-dispensing system of a refrigerator-freezer having an ice-discharge chute passing through a wall of the refrigerator-freezer, the improvement comprising:

first and second doors positioned within the chute at locations spaced one from the other along the length of the chute, each of said doors comprising a plurality of deflectable elements each attached at one edge about the inner walls of the chute and extending toward the chute axis in overlapping relationship, said elements being movable between a first position at which the elements seal the chute and a second position at which the elements are deflected in response to contact by an ice piece for passage of the ice piece through the door and the chute; and

heating elements associated with the overlapping portions of at least a portion of the deflectable elements for preventing freezing of one element to another.

3,934,692
POSITIVE ACTION COIN DISPENSER

Frank A. Novak, Seven Hills; Earl O. Schweitzer, Wickliffe, and Kamal Naik, Euclid, all of Ohio, assignors to Ardac, Inc., Willoughby, Ohio

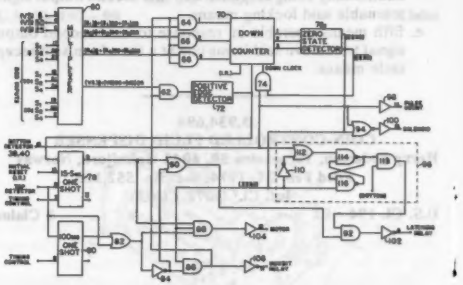
Filed Feb. 25, 1974, Ser. No. 445,058
Int. Cl.[2] G07D 1/04
U.S. Cl. 194—4 C 17 Claims

1. A positive payout coin dispenser operative to dispense change for money of any of numerous denominations, comprising:

first circuit means for determining the validity of the money for which change is desired and producing a signal indicative of the validity and denomination thereof;

coin chutes, one for each denomination of coins to be dispensed, operative to receive coins from associated hoppers and maintain said coins therein; and

second circuit means, interconnecting said first circuit means and said chutes for receiving and responding to

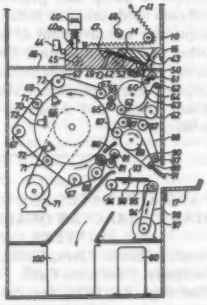


said signal to effectuate the release of respective predetermined numbers of coins from each chute and operative to sense the actual escapment of each coin from each chute; said second circuit means including a solenoid-actuated release mechanism positioned at the bottom of the chute to control the release of coins and a first sensing means positioned above said release mechanism for sensing the passing of a coin from said chute.

3,934,693
AUTOMATIC BANKING DEPOSIT RECEIVING AND HANDLING MACHINE

Kenichi Ooyama, Nagaokakyo, and Syunsuke Matsuo, Muko, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 13, 1974, Ser. No. 496,921
Claims priority, application Japan, Aug. 16, 1973, 48-91857
Int. Cl.[2] G07F 7/10
U.S. Cl. 194—4 R 11 Claims



1. A deposit receiving and handling apparatus, comprising:

a. first means for receiving from a depositor one or more items to be deposited, said first means including a receptacle means having open and closed conditions, said receptacle means being capable of receiving said items from said depositor only when in said open condition, said first means also including locking means normally maintaining said receptacle means in said closed condition,

b. second means for receiving from said depositor a card, said second means including validity checking means

providing a first output signal when a card so received is valid;

c. a third means which is responsive to said first output signal to disable said locking means, whereupon said receptacle means may be operated to its open condition,

d. fourth means detecting an operation of said receptacle means from said open condition to said closed condition to provide a second output signal, said fourth means additionally being responsive to said second output signal to enable said locking means,

e. fifth means operable in response to said second output signal to remove said items one at a time from said receptacle means.

3,934,694

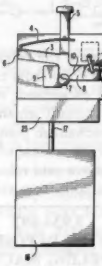
COIN-CONTROLLED FLUID DISPENSER

Harry Pedersen, Terneveien 50, 4042 Hafrsfjord, Norway

Filed Feb. 24, 1974, Ser. No. 552,123

Int. Cl.² G07F *13/02*

U.S. Cl. 194—82 **8 Claims**



1. A coin-controlled apparatus for dispensing a predetermined quantity of a fluid, comprising a coin chute defined in part by a pair of slides, means for inserting a coin in said chute between said slides so as to move one of said slides in one direction, means responsive to movement of said one slide in said one direction to pump said predetermined quantity of fluid while said coin holds said one slide in its moved position, and means responsive to movement of said dispensing means to move the other said slide in another direction different from said one direction when said predetermined quantity of fluid has been pumped thereby to permit said coin to fall out of contact from said slides, and means to return said slides to their initial position.

3,934,695

METHOD AND APPARATUS FOR ENHANCING AND MAINTAINING CHARACTER QUALITY IN THERMAL PRINTERS

Albert W. Kovalick, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 23, 1974, Ser. No. 508,111

Int. Cl.² B41M *5/26*

U.S. Cl. 197—1 R **21 Claims**

1. A printer for printing characters on a printing medium comprising:

a printer head, having a plurality of spaced transducers mounted in a line thereon, movably mounted in close proximity to the printing medium, the line of transducers being oriented transverse to the direction of head movement;

motive means coupled to the printer head for driving the printer head past the printing medium at a predetermined rate;

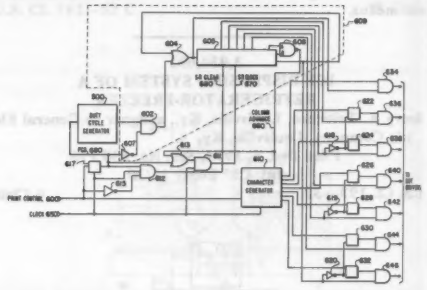
timing means for producing timing signals;

character generating means coupled to the timing means for generating character data signals in response to timing signals therefrom;

slant generating means coupled to the timing means for generating periodic, sequentially-timed command signals at a preselected repetition rate in response to timing signals received therefrom; and

gating means coupled to the printer head, the slant generating and the character generating means for selectively activating successive ones of the transducers in response to command and character data signals to print characters on the printing medium as a matrix of rows and columns of dots, the interval between rows being determined by the spacing between transducers and the interval between columns being determined by the repetition rate of the command signals and the rate at which the printer head is driven.

13. A method for printing characters on a printing medium comprising the steps of:



supplying power;

driving a printer head having a plurality of spaced transducers mounted in a line aligned thereon transverse to the direction of head movement past the printing medium in close proximity thereto and at a predetermined rate;

producing timing signals;

generating character data signals in response to the timing signals;

generating periodic, sequentially-timed command signals at a preselected repetition rate in response to the timing signals; and

activating successive ones of the transducers selectively in response to command and character data signals to print characters on the printing medium as a matrix of rows and columns of dots, the interval between rows being determined by the spacing between transducers and the interval between columns being determined by the repetition rate of the command signals and the rate at which the printer head is driven.

3,934,696

KEYBOARD TOUCH CONTROL

Hans W. Mueller, and Richard E. Shattuck, both of Cortland, N.Y., assignors to SCM Corporation, New York, N.Y.

Filed Aug. 30, 1974, Ser. No. 501,943

Int. Cl.² B41J *5/26*

U.S. Cl. 197—17 **9 Claims**

1. A frame supported keylever touch control mechanism for typewriters having a plurality of keylevers, the touch control mechanism comprising:

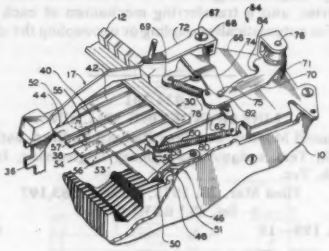
holding means supported on the frame and movable relative to said frame;

control means engaged by said holding means for maintaining a selectable position of said control means;

a plurality of leaf springs underlying and upwardly biasing the keylevers;

a shiftable bail supported on the frame and movable by said control means between an inoperative position and an operative position, the shiftable bail in the inoperative

position being spaced from the keylever leaf springs to avoid affecting the touch of the keylevers and in the operative position being disposed in contact with said leaf springs; and



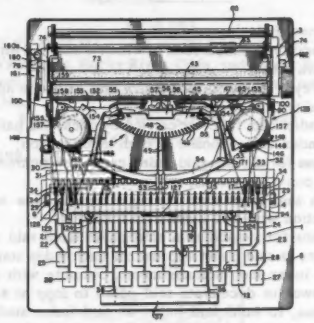
a touch control spring connected to the shiftable bail to cause the bail to add to the upward bias of the leaf springs to effect a heavier touch on the keylevers when the shiftable bail is in the operative position.

3,934,697

SHIFT MECHANISM FOR TYPEWRITER APPARATUS

Shigeaki Kuramochi, 24-17-5-chome, Koishikawa, Bunkyo, Tokyo, Japan

Filed June 6, 1974, Ser. No. 476,847
Int. Cl.² B41J *11/14*
U.S. Cl. 197—72 **3 Claims**



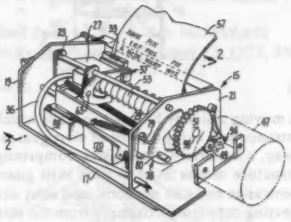
1. Printing type change-over apparatus for a typewriter comprising a printing type change-over lever supporting a key, means mounting said type lever for pivotal movement from a first to a second position upon finger engagement of said key, a change-over actuator lever, means mounting said actuator lever for pivotal movement also from a first to a second position, a rod interconnecting said type lever and actuator lever for conjoint movement of said levers from the first to the second position, a frame member mounted on said actuator lever, a lift actuator, said lift actuator being mounted by said frame member, means urging said lift actuator to a first operative position, a lift plate adapted to be moved in a first direction by said lift actuator, a movable guide frame, means mounting said guide frame on said lift plate for movement with said lift plate and relative thereto, a platen, a platen supporting frame mounted on said guide frame, a plurality of type bars in juxtaposition to one another and each having a type carrier on which different types are disposed in a vertical row, means pivotally mounting said type bars for movement toward and away from said platen, and means operatively connecting said lift plate and lift actuator so that said lift plate moves in the first direction when said type lever moves from the first to second position to locate said platen thereby to be struck by one of said different types.

3,934,698

CARRIAGE MECHANISM FOR PRINTER

Thomas K. McGourty, 1640 Cox Road, Aptos, Calif. 95003

Filed Feb. 1, 1974, Ser. No. 438,794
Int. Cl.² B41J *19/20*
U.S. Cl. 197—90 **1 Claim**



1. A mechanism for carrying a thermal printer head or the like comprising in combination:

a. a frame having a slideably mounted carriage with a printing head thereon adapted to slide from a first side of said frame to the second side of said frame and return,

b. said printing head being adapted to print when traversing from said first side to said second side and to not print when being returned from said second side to said first side,

c. spring means for biasing said carriage from the first side of the frame to the second side of the frame,

d. escapement means for permitting said carriage to move by the action of said spring against said escapement means from the first side of the carriage to the second side of the carriage, said escapement means including a rack lying parallel to the path of travel of said carriage and pivot means on said rack whereby said rack can be rotated from a first position to a second position,

e. means for rotating said rack from said first position to said second position,

f. a first pawl mounted on said carriage, said pawl having a first tooth adapted to engage said rack when said rack is in the first position, and a second tooth adapted to engage said rack when said rack is in said second position, said rack and pawl means permitting said carriage to move stepwise through its path of travel from the first side of said frame to the second side of said frame as said rack is moved from the first position to said second position,

g. power means for returning said carriage from the second side of said frame to the first side of said frame, said power means including a worm extending from one side of said frame to the other and a second pawl on said carriage whereby said second pawl can engage said worm and said worm will move said carriage against said spring, moving said carriage to its opposite limit of travel,

h. means for rotating said worm,

i. said worm having a cam thereon, said cam having three faces, namely, a low concentric face, a cam lobe and a high concentric face,

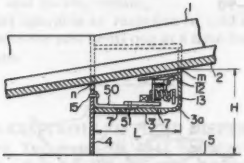
j. a cam follower riding on said low concentric face while said carriage moves stepwise through its path of travel, and

k. means to shift said cam follower to said lobe, whereby said cam follower rises on said lobe to the high concentric face, engaging said second pawl with said worm, whereby the carriage is caused to reverse its path of travel.

3,934,699
HANDRAIL SAFETY DEVICE

Chuichi Saito, Katsuta, and Schoichi Nakao, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 1, 1974, Ser. No. 447,353
Claims priority, application Japan, Mar. 2, 1973, 48-24323
Int. Cl.² B66B 9/12
U.S. Cl. 198—16 14 Claims



1. In a moving stairway having handrails which pass into or out of entrance and exit portions of skirt guards for the moving stairway, a handrail safety device comprising

inlet structure means fixed to each skirt guard adjacent to the entrance and exit portions, said inlet structure means projecting outwardly externally from the skirt guards; and

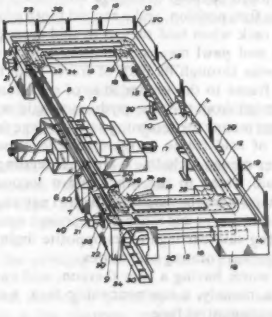
detecting means provided in said inlet structure means for detecting either one of a horizontally directed force acting on said inlet structure means or a vertically directed force acting within said entrance and exit portions to interrupt movement of the moving stairway at the occurrence of such force,

wherein said inlet structure means includes a flexible housing containing said detecting means, said flexible housing having a front end portion being more flexible than the remaining housing portion.

3,934,700
TRANSFER LINE

Paul Schubert, Kirchhein, and Hans Treipl, Oschelbronn, both of Germany, assignors to Cross Europa-Werk GmbH, Wendlingen, Germany

Filed Jan. 7, 1975, Ser. No. 539,063
Claims priority, application Germany, Jan. 12, 1974, 2401503
Int. Cl.² B23Q 7/00
U.S. Cl. 198—19 17 Claims

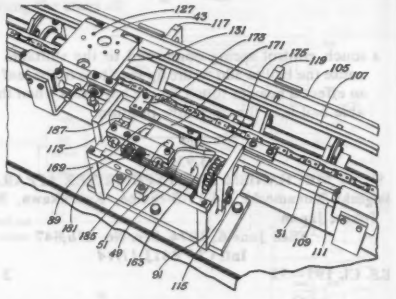


1. In a transfer line of the type having at least one work station for machining workpieces, which can be moved onward rhythmically by a timed drive having a transporting device, and with a substantially U-shaped return line connected at its respective ends to two transfer stations, upon which line workpieces, clamped on a workpiece-carrier, can be slidingly conveyed along a slideway by said transporting device, at least one endless chain on said return line having a pulling length extending along said slideway, entrainment means for coupling the individual workpiece-carriers to the chain at a first point and at a second point, means at the second point permitting relative movement between the chain and carrier, and a transferring mechanism at each transfer station for automatically coupling or uncoupling the chain and carrier.

3,934,701
LINEAR INDEXING MACHINE

John Russell Mooney, and Troy Richard Radford, both of Fort Worth, Tex., assignors to Mooney Engineering, Inc., Fort Worth, Tex.

Filed Mar. 28, 1975, Ser. No. 563,197
Int. Cl.² B23Q 07/16
U.S. Cl. 198—19 6 Claims



1. A linear indexing machine comprising:

a. a plurality of pallets each of which is adapted for carrying a work piece;

b. conveyor means for conveying said pallets to and from a plurality of index stations;

c. an index cam follower carried by each said pallet;

d. an index cam disposed at each index station;

e. means for driving said index cams in synchronism with said conveyor means;

f. each said index cam having a cam surface means for coaction with said index cam follower;

g. means for detaching a said pallet from said conveyor means as said pallet approaches each index station, with said index cam surface means coacting with said cam follower to decelerate said pallet to stop at said index station, to hold said pallet at said index station for a predetermined time interval and to thereafter accelerate said pallet to conveyor speed, and means for thereafter attaching said pallet to said conveyor means.

3,934,702
ARTICLE TRANSFER APPARATUS

Alan Kent Snyder, River Forest; Arthur D. Schmidt, Elgin, both of Ill.; Seldon T. Foote, deceased, late of South Bend, Ind., and by Robert R. Clipp, executor, assignors to Chicago Display Company, Melrose Park, Ill.

Filed Sept. 13, 1973, Ser. No. 396,889
Int. Cl.² B65G 47/00
U.S. Cl. 198—20 8 Claims

1. Improved packaging apparatus comprising:

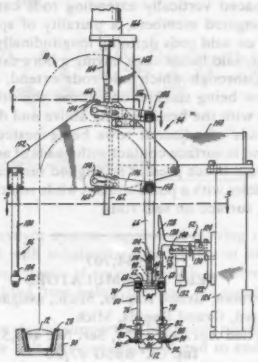
conveyor means for conveying articles to a transfer station;

a plurality of gripping means positioned to receive a plurality of articles from said conveyor means, said gripping means comprising oppositely disposed elastic bands for gripping the sides of said articles;

engagement means associated with each of said gripping means for displacing said elastic bands toward one another to grip articles at said transfer station in a predetermined spatial relationship with respect to one another;

sensor means for sensing the presence of an article in each of said gripping means, said sensor means being operatively connected to actuate said engagement means;

transfer means for transferring said gripping means from said transfer station to a receiving station; and



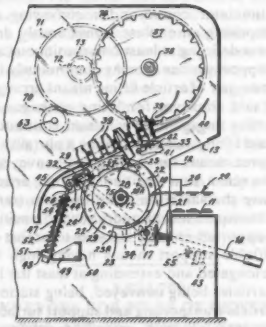
disengagement means for moving said elastic bands away from one another at said receiving station, whereby to release articles engaged by said gripping means.

3,934,703

CONTAINER DISCHARGER WITH SAFETY MECHANISM

Michael Vamvakas, Rocky River, Ohio, and Momir Babunovic, Des Peres, Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Dec. 20, 1974, Ser. No. 534,743
Int. Cl.² B65G 47/00
U.S. Cl. 198—22 B **7 Claims**



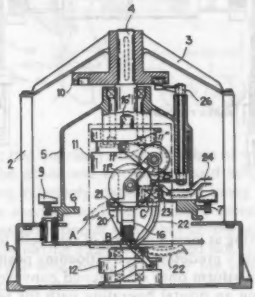
1. Discharge apparatus for containers moved by a pocketed conveyor into a discharge zone comprising: rotary cam means adapted to receive bottles in a gravity discharge zone from the conveyor pockets, bottle sensing finger means adjacent said cam means in said zone, said sensing finger means having a free end adjacent said cam means and an extension on said free end disposed in the path of the bottles moved into said discharge zone, means supporting said sensing finger means for movement between a normal position guiding the bottles dropped in said zone onto said cam means and a displaced position sensing a bottle jammed in said zone; means normally driving said pocketed conveyor and said cam means in timed relation, and a safety device to stop said drive, said safety device having a normal position corresponding to the normal position of said sensing means and the normal driving of said pocketed conveyor and cam means, and said safety device having a drive stop position corresponding to said displaced position of said sensing finger means, said safety device being moved into said drive stop position upon said sensing finger means moving to said displaced position.

3,934,704

DEVICE FOR A CONTROLLED, CENTRIFUGAL DISTRIBUTION OF PRODUCTS TO POST-FINISHING MACHINES

Ottorino Pisoni, Corso Sempione 51, Busto Arsizio (Varese), Italy

Filed June 13, 1973, Ser. No. 369,492
Claims priority, application Italy, June 13, 1972, 25602/72
Int. Cl.² B65G 47/52
U.S. Cl. 198—25 **8 Claims**



1. A device for a controlled, centrifugal distribution of product pieces from a slow traveling band conveyor to pans on a high speed conveyer for delivery to a post-finishing machine, said device comprising a horizontally revolving trunnion type fixture, transfer means centrally located in said fixture for removing product pieces from the slow traveling band conveyor, radially extending guides positioned on said trunnion type fixture to receive said pieces from said transfer means and to transport the pieces under the action of centrifugal force in outward radial direction, at a progressively increasing speed, from the center to the periphery of said trunnion type fixture, and means on said fixture for revolvingly interlocking the same with the high speed conveyor carrying the pans, such that each product, delivered by the trunnion type fixture, is transferred to and accurately positoned in a respective pan.

3,934,705

SYSTEM FOR OFFLOADING ARTICLES FROM A CONVEYOR BELT

James L. Balch; James E. Anderson, and Boleslaus J. Sadeski, all of Madison, Wis., assignors to Oscar Mayer & Company, Incorporated, Madison, Wis.

Filed Mar. 1, 1974, Ser. No. 447,354
Int. Cl.² B65G 47/26
U.S. Cl. 198—32 **11 Claims**

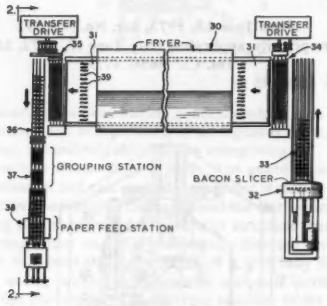
1. A system for transferring a product from a first conveyor to a second conveyor at right angles to said first conveyor, said system comprising, in combination:

a loading platform comprising a plurality of parallel spaced-apart cantilevered support rods arranged at the discharge end of said first conveyor to form a contiguous path therewith for said product;

means for rotating at least a portion of said support rods so as to move said product from said first conveyor into a predetermined loading position on said loading platform;

at least one product transfer carriage comprising a plurality of parallel spaced-apart cantilevered support members anchored to a carriage support block at one end, said support members being arranged to form a product supporting platform and spaced so as to pass between respective ones of said cantilevered support rods;

an offloading platform comprising a plurality of parallel spaced-apart cantilevered conveyor belts arranged at the input end of said second conveyor to form a contiguous path therewith for said product, said belts being substantially parallel to said support members and being spaced to allow respective ones of said support members to pass therebetween;



means for driving at least a portion of said belts to move said product from a predetermined offloading position on said offloading platform onto said second conveyor;

means defining an orbital operating path for said product transfer carriage whereby said support members are caused to successively pass between said cantilevered support rods and said cantilevered conveyor belts while being maintained in a substantially horizontal plane; and

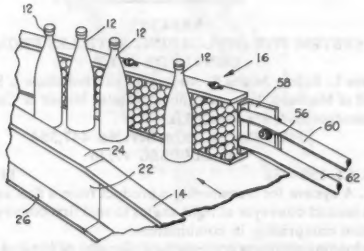
drive means for advancing said product transfer carriage along said operating path to transfer said product from said predetermined loading position to said predetermined offloading position.

3,934,706

ARTICLE COMBINING LIVE WALL GUIDE RAIL

Joseph Tice, 502 Poinsettia Drive, Simpsonville, S.C. 29681

Filed June 24, 1974, Ser. No. 482,757
Int. Cl.² B65G 47/26
U.S. Cl. 198—32 **3 Claims**



1. An apparatus for channeling a disorderly array of articles being transported on a conveyor into a uniform row of articles, said articles being moved on a conveyor, the improvement comprising:

a pair of spaced articles confining walls;

said spaced walls converging towards each other in a direction corresponding to the flow of said articles on said conveyor;

said spaced walls having a wide end for receiving said disorderly array of articles and a narrow end for exiting a uniform row of said articles; one of said walls including a pair of vertically spaced elongated members, longitudinally spaced vertically extending rods carried between said elongated members, a plurality of spherical beads carried on said rods defining longitudinally spaced rows of beads, said beads each having a bore extending therethrough through which said rods extend, said beads of each row being stacked one above the other in surface contact with the bead directly above and directly below, said beads of adjacent rows being nested within each other and in surface contact with beads of adjacent rows;

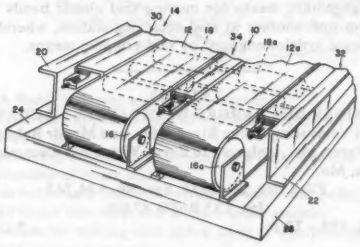
whereby said beads present an aligned surface for engaging said articles with a point contact while rotating on a larger bearing surface on said rods.

3,934,707

BELT ACCUMULATORS

Clyde L. Bowman, Grand Rapids, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Apr. 24, 1974, Ser. No. 463,525
Int. Cl.² B65G 47/26
U.S. Cl. 198—34 **7 Claims**



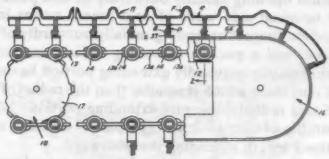
1. An accumulator conveyor for conveying articles and packages comprising an endless, continuously driven article transport means defining at least one continuous article transporting and support surface moving continuously in one direction, at least one pair of article lifting means arranged adjacent each side of said conveyor for lifting packages and articles from transporting engagement with said continuous supporting surface; said lifting means including a plurality of vertically shiftable support means for shifting the conveyed articles or packages between a first position wherein articles on said conveyor above the same are lifted up from transport influence by said transport means and a second position in which articles are supported entirely on said transport means; said vertically shiftable support means having high friction surfaces, being elongated and extending at least the length of the packages or articles being conveyed, being stationary lengthwise of said article transporting and support surface, and being arranged adjacent, along and generally parallel to each side of said article transporting and support surface; said support surface extending substantially entirely between said pair of vertically shiftable support means to substantially entirely support any packages and articles on said support surface; a normally inoperative powered actuator for raising and lowering each of said support means; a sensor connected to each of said powered actuators for actuating the same in response to the presence of an article; a stop; means for moving said stop into the path of any articles or packages on said transport means; means interconnecting said stop and said sensor to allow activation of said actuators only when said stop is in the path of any articles or packages on said transport means.

3,934,708

FLEXIBLE BELT CONVEYOR SYSTEM WITH TRACK-CONTAINED ROLLER, CARRIER AND CHAIN ASSEMBLY

Goro Kambara, 1528 Osceola St., Denver, Colo. 80204

Filed June 24, 1974, Ser. No. 482,593
Int. Cl.[2] B65G 41/00
U.S. Cl. 198—109 13 Claims



1. In a conveyor system capable of moving up and down, laterally, and with substantial rotation about its longitudinal axis along the course of travel through a curved path while supporting a load from below the load, the combination comprising:

a flexible, material-supporting belt made up of a plurality of repetitive belt sections arranged end to end;

a generally channel-shaped track having inside track surfaces arranged for establishing a selected course of travel for the belt, said track including a top run in which the belt is arranged for supporting a load thereon from below the load, said top run having a track section with a center slot in a top wall and a closed bottom wall; and

belt moving means including a pulling chain adapted to be moved by a source of motive power, said pulling chain having a series of generally ellipsoidal-shaped alternating horizontal and vertical interconnnected links extending along the inside of the track and a plurality of roller carriages releasably affixed at selected spaced intervals to the link chain to space said roller carriages along the track, each said roller carriage having a main body portion, a pair of side portions projecting laterally outwardly from opposite sides of said main body portion and a neck portion extending from said main body portion through and beyond the center slot and affixed to the belt, each said main body portion having a center slot centered so that the geometric center of one of said chain links positioned in said center slot is in the geometric center of said main body portion, at least one support roller mounted on each of said side portions, said support rollers being contained entirely within the track and bearing on the inside track surfaces as said support rollers move inside said track, said side portions being symmetrically arranged on each side of a horizontal center line through the geometric center of said main body portion whereby load forces applied to the main body portion from the rollers are at all times in a direction toward the geometric center of the associated main body portion.

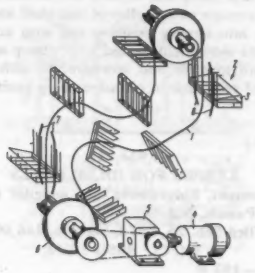
3,934,709

CONVEYORS FOR PILES OF NEWSPAPERS

Nikolai Ivanovich Anikanov, Bolshaya Bronnaya ulitsa, 2/6, kv. 6; Leonid Pavlovich Grachev, ulitsa Lva Tolstogo, 7, kv. 32; Grigory Avramovich Radutsky, 16 Parkovaya ulitsa, 49, korpus 2, kv. 68, all of Moscow, and Rafail Efimovich Kheifets, Brest-Litovsky prospekt, 162, kv. 30, Kiev, all of U.S.S.R.

Filed Nov. 26, 1974, Ser. No. 527,232
Claims priority, application U.S.S.R., July 29, 1974, 2044111
Int. Cl.[2] B65G 15/00
U.S. Cl. 198—158 2 Claims

1. A conveyor for piles of newspapers, comprising: an endless chain movable along a three-dimensional path having areas where piles of newspapers are loaded thereon and unloaded therefrom; means for effecting motion of said chain along said path; cam means mounted at said loading and unloading areas; carriages mounted on said chain for joint travel therewith; a clamp mounted on each said carriage and comprising two spring-urged flaps, each in the form of a fork, with the two flaps together making a closed receptacle adapted to accommodate therein a pile of newspapers; one of said two forks having prongs bent at both ends thereof toward the other one of said flaps and being curved centrally thereof to form a convex portion facing the same direction as said



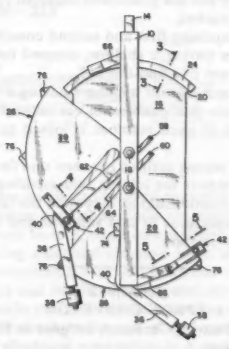
bent ends; two coaxially arranged tubes of which one is internal and the other one is external; said internal one of said tubes being relatively stationary and being secured on said respective carriage and having made therein a rectangular slot; said external one of said tubes having said flaps mounted thereon and having a helically shaped slot made therein, with said external tube being mounted for rotation about said internal tube; a stud extending through said slots; a follower fastened on said stud adapted to engage at said loading and unloading areas said cam means of said conveyor to effect rotation of said external tube relative to said internal tube, whereby the opening and closing of said flaps is effected.

3,934,710

MATERIAL HANDLING CONVEYOR

John Meredith Leach, P.O. Box 341, Port Jefferson, N.Y. 11777

Filed June 26, 1974, Ser. No. 483,250
Int. Cl.[2] B65G 17/16; B65D 45/06
U.S. Cl. 198—143 11 Claims



8. A material handling system comprising a supporting conveyor, a material holding magazine including a shell having a bottom opening, a movable closure for said opening, means for moving said closure from an open to a closed position, and a supporting frame for said magazine connected to

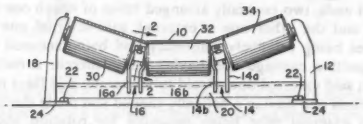
and extending from said conveyor down under said magazine and in contact with said closure when in closed position so as to carry the full load of said magazine and its contents when said closure is in closed position and thus relieve said shell of of the weight load of said magazine and its contents.

10. A material holding magazine comprising a shell having an opening therein surrounded by walls which have arcuate extremeties on two opposite sides, a movable closure for said shell opening which is curved to fit the arcuate extremeties of said walls, a movable lever pivotally mounted directly on said shell for arcuate movement only, and means interconnecting said closure and lever which causes said arcuate movement of said lever to first move said closure across and in close proximity to said arcuate extremeties of said shell and adjacent to said opening into closing position and stop and then upon further arcuate movement of said lever clamp said closure in a straight path towards and into contact with said arcuate extremeties of said shell in closed, sealing position over said opening.

3,934,711
KEEPER FOR IDLER ROLLS

Ralph W. Coutant, Ridgewood, N.J., assignor to Litton Systems Inc., Passaic, N.J.

Filed Feb. 26, 1974, Ser. No. 446,009
Int. Cl.² B65G *39/12*
U.S. Cl. 198—192 R **8 Claims**



1. An idler roll set comprising, in combination,

a. a bracket having a frst and a second support spaced and interconnected by a continuous loop that spans a predetermined distance between said supports,

b. said first and second supports having upwardly opening apertures defined therein,

c. a pair of ears projecting beyond said continuous loop, one ear situated at each lateral side of the bracket,

d. idler rolls having support surfaces defined at each end thereof,

e. said support surfaces being insertable into said apertures in a vertical direction so that opposite ends of a first and a second idler roll are positioned adjacent to one another within said bracket,

f. a keeper comprising first and second coacting members, each member having a shallow, creased body and a leg depending from one end thereof,

g. said leg of each of said members having a first aperture formed therein that enables an ear on said loop to pass therethrough as each member is joined to the bracket, and

h. interlocking means defined between said first and second coacting members for joining said members together in overlapping relationship as they span the lateral distance across said apertures in said supports and lock the idler rolls in fixed position.

3,934,712
APRON CONVEYOR

Wilhelm Jende, Tostedt, Germany, assignor to Pilot Hydraulik GmbH, Germany

Filed Dec. 28, 1973, Ser. No. 429,198
Int. Cl.² B65G *15/52*
U.S. Cl. 198—195 **9 Claims**

1. A conveyor assembly comprising:

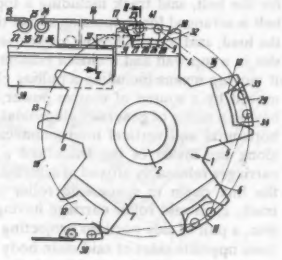
a pair of pulleys each rotatable about an axis and spaced apart with their axes generally parallel to define an endless path of travel extending between said pulleys and about their peripheries, with a pitch circle being defined about each of said pulleys having a center which is coincident with the axis of rotation of each pulley, respectively;

a plurality of recess means defined about the periphery of each of said pulleys, each of said recess means being defined between at least a pair of circumferentially spaced curved convex terminal side walls extending generally parallel to said pulley axes with a widening configuration opening radially outwardly of said pulleys;

said terminal side walls of said recess means including a portion thereof extending radially outwardly of said pitch circle and a portion extending radially inwardly therof, said radially outwardly extending portion having a radius of curvature which is smaller than the radius of curvature of said radially inwardly extending portion;

a plurality of slats each having a pair of ends and a predetermined length extending therebetween;

a plurality of connecting means each joined between the ends of adjacent slats to form said slats in an endless assembly extending in a direction lengthwise of said slats along said endless path of travel between said pair of pulleys;



said connecting means including means enabling relative pivotal motion between each of said connecting means and each of said slats joined thereto about a pivot axis extending generally parallel to said axes of said pulleys;

means defining on each of said connecting means at least a pair of opposed convex walls adapted to be engaged within each of said recess means between terminal side walls thereof, said opposed convex walls being spaced apart in the direction of said endless path of travel a distance commensurate with spacing between said terminal side walls to enable each pair of said opposed convex walls to be engaged with rolling contact in succession between pairs of said terminal side walls during rotation of said pulleys;

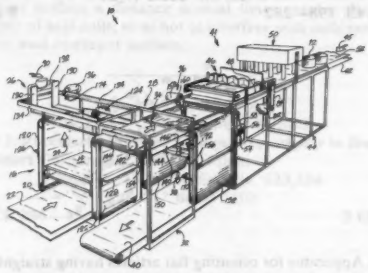
each of said recess means being spaced apart circumferentially about said pulleys a distance determined by said predetermined length of said slats to enable said connecting members to become engaged in succession within said recess means to drive said endless slat assembly through said endless path of travel upon rotation of said pulleys;

said terminal side walls of said recess means and said opposed convex walls of said connecting means being configured to form said pulleys and said connecting means essentially as intermeshing gearing members.

3,934,713
METHOD AND APPARATUS FOR PALLETIZING ARTICLES

Richard H. Van der Meer, Golden, and Dan A. Gabrielson, Lakewood, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 2, 1971, Ser. No. 168,237
Int. Cl.² B65G 47/26
U.S. Cl. 198—34 1 Claim



1. An assembly for transferring articles from a first area to a second area, said assembly comprising: support means adapted to be moved along a closed loop endless path; first means connected with said support means and movable with said support means along said path, said first means being adapted for engagement with at least one of said articles when said one article is within said first area and when said first means is moved along a predetermined portion of said path whereby said first means moves said one article by pushing towards said second area; second means connected with said support means a distance of approximately one-half of said path from said first means and movable therewith, said second means being adapted for engagement with at least a subsequent article received within said first area when said second means is moved along a predetermined portion of said path for moving said subsequent article towards said second area; third means connected with said support means, movable therewith and positioned directly behind said first means, said third means being adapted for blocking the transfer path between said first and second areas when said third means is at a predetermined point along said fixed path; and fourth means connected with said support means, movable therewith and positioned directly behind said second means a distance of approximately one-half of said fixed path from said third means, said fourth means being adapted for blocking said transfer path when said fourth means is at a predetermined point along said fixed path.

3,934,714
METHOD AND APPARATUS FOR REGULATING ORIENTATION OF CONTAINERS OR THE LIKE

Takao Matsumoto, Amagasaki, Japan, assignor to Yamamura Glass Kabushiki Kaisha, Japan

Filed May 9, 1974, Ser. No. 468,520
Int. Cl.² B65G 47/24
U.S. Cl. 198—244 2 Claims

1. An apparatus for regulating the orientation of containers or like articles, each formed with a screw thread around its mouth portion, during transport comprising:

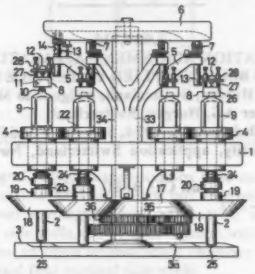
a turntable disposed at one side of a conveyor for transporting the articles at a constant speed and rotatable in timed relation to the conveyor;

a plurality of rotary tables supported by the turntable in circumferentially equidistant arrangement and each rotatable about its axis, the rotary tables being adapted to receive the articles from the conveyor and to rotate the received articles each about its axis;

transfer means for transferring the articles from the conveyor onto the rotary tables, one by one;

detecting means disposed above the rotary tables and identical in number to the number of the rotary tables, the detecting means capable of sending signals to a drive means being adapted to revolve at a speed equal to that of the turntable, each of the detecting means being engageable with the screw thread around the mouth portion of the article;

means for operating the detecting means to bring each of the detecting means into elastic pushing engagement with the screw thread around the mouth portion of the article



within a specified range of angle of revolution of the detecting means and to disengage the detecting means from the screw thread outside the range;

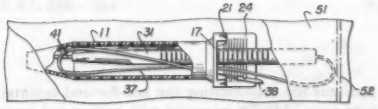
drive means for rotating the rotary table about its axis in response to a signal detecting the engagement of the detecting means with the screw thread and for stopping the rotation of the rotary table in response to a signal detecting that the engagement has changed as the rotary table rotates; and

delivering means for delivering the articles from the rotary tables onto the conveyor after the articles have been positioned in a specified orientation upon completion of the detecting operation.

3,934,715
CAUTERIZING INSTRUMENT AND HOLDER

Frank P. Antonini, 3526 Divisadero, San Francisco, Calif. 94117, and Julien I. Schwalbe, 6215 Ascot Drive, Oakland, Calif. 94611

Filed May 20, 1974, Ser. No. 471,197
Int. Cl.² B65D 69/00, 81/24
U.S. Cl. 206—223 2 Claims



1. A kit for an electro-surgical cauterizing instrument comprising a hollow handle, an electrode insertable in and removable from said handle, an electrical fitting in said handle, said handle having electrical contacts in its interior to establish electrical connection with said electrode when said electrode is inserted in said handle, an elongated core connected to said contacts inside said handle and extending out one end of said handle, a terminal on the end of said cord remote from said handle for electrical connection to a cauterizing machine, a holder formed with a sheath to receive said electrode and handle and having one closed end, said handle with said electrode inserted therein being insertable in and removable from said holder and said electrode being protected from electrical and germ contact with the exterior when inserted in said holder, said holder being substantially larger than said handle,

a flange on the open end of said sheath opposite said closed end, said flange formed with means for attachment of said holder to a surgical drape, and an envelope to maintain said handle, electrode and holder sterile until said envelope is opened, said electrode being inserted into said handle and electrically connected to said contacts, said electrode and the end of said handle adjacent said electrode being positioned inside said sheath, most of said cord being inside said sheath, said terminal being exposed immediately outside said sheath, said envelope enclosing the assembly of holder, handle, core and terminal.

3,934,716

ORIENTATION ALIGNMENT APPARATUS FOR YARN COPS BEING SUPPLIED TO TEXTILE MACHINES

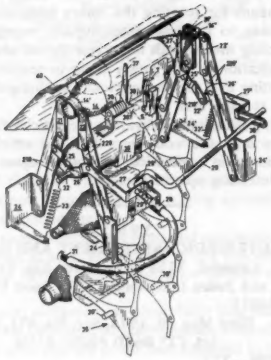
René Heckel, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Oct. 25, 1974, Ser. No. 517,857

Claims priority, application Switzerland, Nov. 13, 1973, 15940/73

Int. Cl.² B65G 47/24

U.S. Cl. 198—252 20 Claims



1. Apparatus for coordinating the end-for-end orientation of spinning cops (14) for transport with proper end orientation to a textile machine having

a transport means (15, 35) transporting spinning cops with random end-for-end orientation, and orientation means (46, 46′; 87, 87′) to orient the cops to have a predetermined end-for-end orientation and to deliver the oriented, aligned cops to the textile machine,

comprisiag

spaced movable measuring means (21, 22; 21′, 22′; 31) located in the transport path of the cops engaging the end portions of the cops to measure the diameters thereof;

means coupled to the measuring means to provide a measuring result signal representative of the difference of the diameters, as measured, thereof;

and control signal generating means (63-69; P, 91) applying said measuring result signal to the orientation means to effect delivery of a cop, in oriented alignment upon command of said control signal.

3,934,717

FLAT-ARTICLE ORIENTING APPARATUS FOR AN AUTOMATIC MAIL HANDLING SYSTEM OR THE LIKE

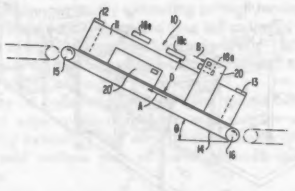
Takeo Katagiri, and Shinichi Fujiwara, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 25, 1974, Ser. No. 454,496

Claims priority, application Japan, Mar. 26, 1973, 48-35461

Int. Cl.² B65G 47/24

U.S. Cl. 198—282 9 Claims



1. Apparatus for orienting flat articles having straight edges such that a long edge of the article is brought into or retained in contact with the bottom surface of a transport path, said apparatus comprising:

a. an upwardly open, U-shaped transport path adapted to retain flat articles having straight edges and coefficients of friction of k_2 relative to each other in an orientation such that their planar surfaces are generally parallel to the sides of said U-shaped transport path, the bottom of said U-shaped transport path being made of a material having a coefficient of friction of k_2 with respect to the flat articles which are to be oriented by the apparatus, and

b. at least one member disposed above said U-shaped transport path by a predetermined distance and having a surface in a plane generally perpendicular to the bottom of said U-shaped transport path and oriented at an acute angle to the flow of flat articles in said U-shaped transport path, the said surface of said member being made of a material having a coefficient of friction of k_1 with respect to the flat articles which are to be oriented by the apparatus, the coefficient of friction k_1 being smaller than the coefficient of friction k_2 but larger than the coefficient of friction k_3.

3,934,718

SUPPLY CONTAINER WITH CONVEYOR BELT FOR RECEIVING AND SUITABLY ORIENTING TEXTILE COILS OR THE LIKE

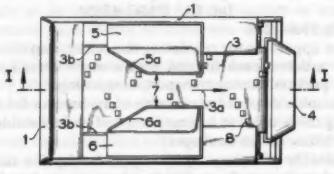
Willi Küpper, Rickelrath, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Sept. 11, 1973, Ser. No. 396,250

Claims priority, application Germany, Sept. 15, 1972, 2245375

Int. Cl.² B65G 47/14

U.S. Cl. 198—287 4 Claims



1. In combination, a supply container and a conveyor belt for receiving and orienting textile coils and the like, said

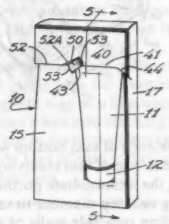
conveyor belt having a conveyor surface extending into said supply container, at least part of said container extending over said conveyor surface, said container having diverting cover means disposed so as to divert at least part of the textile coils from said conveyor surface, wherein said cover means comprises two collecting shells defining, above said conveyor surface, a gap extending in longitudinal direction of said conveyor belt and sloping toward the edges of said conveyor belt, said gap being shaped so that coils can escape upwardly through the gap, said cover means being spaced above said conveyor surface a distance several times greater than the diameter of said coils, so as not to interfere with coils properly held on said conveyor surface.

3,934,719

DISPLAY CARTON FOR TUBES

Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Nov. 13, 1974, Ser. No. 523,216
Int. Cl.² B65D 5/50
U.S. Cl. 206—45.14 3 Claims



1. A carton made from foldable paperboard or similar sheet-like material and suitable for storage, shipment and display of deformable dispensing tubes or the like, said carton comprising:

opposed, parallel front and back panels;

first and second side panels in opposed relation connecting said front and back panels in a rectangular tube-like configuration;

means for supporting the cap of said tube, said means adapted to bear the weight of said tube and locate said tube near said front panel;

an elongated die cut opening in said front panel located above said means for supporting said tube and adapted to serve as a clearance recess for at least a portion of said tube;

a tube base restraining section formed in a first portion of said front panel including a first line cut formed horizontally across said first portion of said front panel and spaced above said means for supporting said tube and said tube opening, said first line cut having downwardly angled portions on either side thereof to permit that portion of said front panel located below said first line cut to be flexed inwardly and thereby create a recessed slot adapted to receive the crimped base of said tube and hold it in place against the portion of said front panel located above said first line cut; and

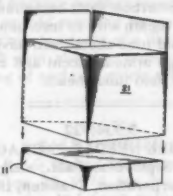
a downwardly angled connecting section at one side of said first line cut connecting said first line cut to a second line cut extending horizontally across the remainder of said front panel, said downwardly connection section permitting that section of said front panel below said line cut to flex inwardly to receive said tube yet allowing the remainder of said front panel above said line cut to stay in normal flat position.

3,934,720

SUSPENSION BOX FOR SHIPPING FURNITURE

John R. Kratochvil, Jr., Newton, N.C., assignor to Boise Cascade Corporation, Boise, Idaho

Filed Feb. 15, 1974, Ser. No. 443,032
Int. Cl.² B65D 85/00, 81/02, 5/35
U.S. Cl. 206—326 22 Claims



1. A shipping container for articles of furniture and the like, comprising

a. an integral hollow suspension box base unit for supporting the article, said suspension box base unit consisting of horizontal rectangular top and bottom walls and four vertical side walls, said top and bottom walls being spaced to define an open unobstructed chamber extending between said four vertical side walls;

b. a cover consisting of horizontal top and vertical side walls, said cover being open at its bottom thereby to permit said cover to be fitted downwardly over the article to a closed position in which the cover top wall is spaced from the top wall of said suspension box base unit, thereby to enclose the article of furniture, and the lower edge portions of said cover are adjacent the outer surface of the vertical side walls of said base unit; and

c. means connecting the lower edge portions of said cover with the vertical side walls of said base unit;

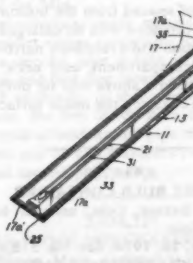
d. at least the top wall of said base unit being imperforate and formed of a material which deflects under load, thereby to cushion the article against shock forces applied to said container.

3,934,721

PACKAGED CATHETER ARRANGEMENT

Robert W. Juster, St. Louis, Mo., and William E. Patton, North Canton, Ohio, assignors to Affiliated Hospital Products, Inc., St. Louis, Mo.

Continuation of Ser. No. 149,990, June 4, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,584
Int. Cl. A61b 19/02; A61m 25/00
U.S. Cl. 206—364 9 Claims



1. A packaged catheter arrangement, comprising

a flexible rubber catheter having an easily flexible insertion shaft with an insertion tip at one end and having two divergent fluid passage arms,

a flexible tube sheath, the tubular extent and shape of said tube sheath laterally enveloping and serving to protect the length of said catheter insertion shaft during and

subsequent to assembly as a dual component unit of said packaged catheter arrangement,

said tube sheath being closed at one end and open at its other end,

the interior of said tube sheath being of a size to accommodate said catheter shaft, but insufficient to accommodate said two divergent fluid passage arms,

and said catheter insertion shaft being removably disposed within said tube sheath with its insertion tip adjacent said closed end of said tube sheath and having its two divergent fluid passage arms adjacent and extending beyond said open end of said tube sheath.

3,934,722

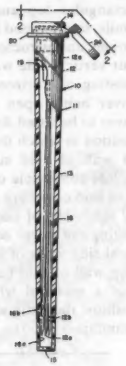
STERILE NEEDLE PACKAGE

Allan M. Goldberg, Sepulveda, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 26, 1974, Ser. No. 500,292

Int. Cl.² B65D *85/24*

U.S. Cl. 206—365 **15 Claims**



1. A needle package comprising a cartridge having a stiff elongated tubular body closed at its lower end and open at its upper end, a removable cap closing said open upper end, and a needle loosely supported within said cartridge, said needle having a sharpened tip portion at its lower end and an enlarged hub at its upper end, said cartridge body being provided with an internal ledge spaced below the body's upper end and engaging the underside of said hub to support said needle with the tip portion thereof spaced from the bottom of said body, said body also being provided with an enlarged compartment enclosing said tip portion and a relatively narrow neck portion directly above said compartment, said neck portion being engagable with said needle above said tip portion to prevent said tip portion from engaging the inside surface of said compament.

3,934,723

LIGHT BULB CONTAINER

Stephen F. Walker, Denver, Colo., assignor to Alan P. McGregor, Denver, Colo.

Filed Nov. 18, 1974, Ser. No. 518,690

Int. Cl.² B65D *1/00, 85/42*

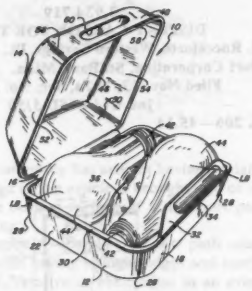
U.S. Cl. 206—422 **6 Claims**

1. A nestable container for light bulbs, said container comprising in combination:

an open-topped receptacle of quadrangular horizontal cross-section having bottom and side walls, said receptacle side walls forming an angle with vertical so as to be downwardly convergent,

a top member adapted to lie over the open top of said receptacle, said top member having a top wall and side walls, said top member side walls forming an angle with vertical so as to be upwardly convergent,

a raised partition formed in said bottom wall of said receptacle having upwardly convergent sides defining an uppermost edge and opening downwardly to the bottom of said receptacle for defining separate light bulb receiving areas, said partition being generally S-shaped so that light bulbs placed in adjacent receiving areas are diametrically opposed, said uppermost edge of said partition extending to the height of said receptacle, tapering downwardly into ends level with said bottom wall, and terminating slightly



short of the side ends of said bottom wall so that said light bulb positioned in one of said receiving areas engages said partition along the intermediate portion of said light bulb,

means for hinging said top member to said receptacle along the corresponding rear side walls of said receptacle and said top member, and

means for releasably connecting said top member with said receptacle along the front side walls of said container so that when said top member is connected to said receptacle the enlarged glass end of said light bulb frictionally engages said top wall, said bottom wall, and two side walls of said receptacle and the metallic contact end of said light bulb frictionally engages said bottom wall and one side wall of said receptacle.

3,934,724

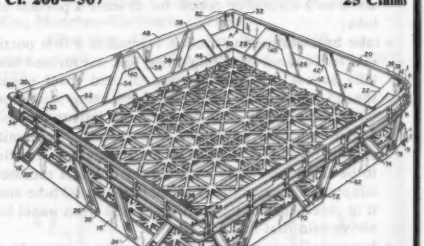
NEST AND STACK CONTAINER

Lewis T. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1974, Ser. No. 434,094

Int. Cl.² B65D *21/04*

U.S. Cl. 206—507 **25 Claims**



1. A generally rectangular nesting and stacking container comprising:

a generally horizontally disposed bottom; opposed first and second wall structures respectively projecting upwardly

from opposed first and second sides of said bottom; with each of said wall structures comprising, in combination:

a pair of spaced apart guide lugs projecting outwardly from a said side of said bottom, one of said lugs being adjacent one end of said side of said bottom and the other lug adjacent the other end of said side;

a guide rail disposed generally vertically above said side of said bottom for receiving and supporting on its upper surface a said guide lug of a like upper container only during pre-nesting and pre-stacking operations;

a plurality of spaced apart inclined bar members extending upwardly between said side of said bottom and the inner surface of said guide rail for supporting said guide rail, and arranged so that, , whereby an upper said container will nest within a like oriented lower said container with the bars of corresponding wall structures paralleling each other but will stack on a reversely oriented lower said container as described hereinafter;

a plurality of stacking saddles provided on the tops of a like plurality of said bar members at an elevation less than that of said upper surface of said guide rail;

a plurality of stacking feet provided on the bottoms of a like plurality of said bar members at an elevation greater than that of said guide lugs for registering in vertical alignment with a said plurality of stacking saddles on a said reversely oriented like lower container in supporting a said upper container on a said lower container in stacking relationship; and

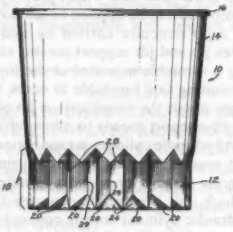
clearway means provided in said guide rail in vertical alignment with said guide lugs for permitting passage therethrough of the guide lugs of a like upper container during nesting operations when said stacking feet and said stacking saddles are not in vertical alignment, and for receiving therein the guide lugs of said upper container at the end of stacking operations.

3,934,725

NESTABLE ARTICLE

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 233,979, March 13, 1972, abandoned. This application July 2, 1973, Ser. No. 375,423
Int. Cl.² B65D *21/02*
U.S. Cl. 206—519 **2 Claims**



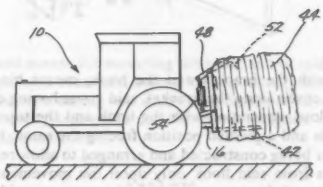
1. In a generally nestable article which is formed from a substantially uniform thickness sheet material, the improvement of stacking means which permits non-jamming nesting of a plurality of identically formed such articles for the storage and transport of said articles in nested stacks, said stacking means formed in a wall of said article and comprising a series of contiguous stacking abutments each comprising a pair of planar surfaces angularly arranged relative to each other and to the axial direction of nesting of said articles and said abutments being continuously circumferentially arranged in said wall of said article and extending in a radial direction, a series of contiguous stacking recesses each comprising a pair of planar surfaces angularly arranged relative to each other and to the axial direction of nesting of said articles and said recesses being continuously circumferentially arranged in said wall with adjacent recesses having a portion thereof meeting on a juncture line extending in a radial direction opposite from the radial direction of said stacking abutments, said stacking recesses further being axially spaced and circumferentially offset from said stacking abutments, and said juncture lines forming a series of guiding means in said wall at the line of contiguity of said stacking recesses and extending in the same radial direction as said stacking recesses for engaging and guiding the stacking abutments of a like article into stacking cooperation with said stacking recesses during telescopic concentric nesting of said like article therein.

3,934,726

BALE CARRIER

Leon C. Martin, R.F.D. 2, Box 36, Greenfield, Iowa 50849

Filed Apr. 29, 1974, Ser. No. 465,421
Int. Cl.² A01D *89/00*
U.S. Cl. 214—131 A **4 Claims**



1. A bale carrier for use with a tractor three-point hitch having three lifting arms extending rearwardly therefrom comprising,

an elongated first horizontally disposed support means, said first support means being transversely disposed with respect to the longitudinal axis of the tractor,

a pair of tine members operatively secured to said first support means adjacent the opposite ends thereof and extending rearwardly therefrom for piercing engagement with the bale above the lower end thereof,

first connection means for operatively connecting said first support means to two of the lifting arms,

second support means extending upwardly from said support means, second connection means for connecting said second support means to the third lifting arm,

an arm means pivotally secured to said second support means adjacent the upper end thereof and extending rearwardly therefrom,

means on said arm means for engagement with the upper portion of the bale,

means for selectively pivotally moving said arm means,

said first support means comprising a first pipe means and wherein a second pipe means is selectively rotatably mounted in said first pipe means and has its opposite ends positioned outwardly of the opposite ends of said first pipe means, the two lifting arms being secured to the opposite ends of said second pipe means, one tine member of said pair of tine members being secured to each end of said second pipe means.

3,934,727

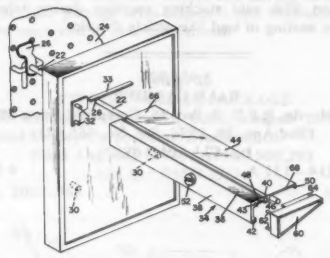
PILFER-PROOF MERCHANDISE DISPLAY

Paul Brefka, Boston, Mass., assignor to Henry L. Hanson Co., Inc., Worcester, Mass.

Filed Nov. 18, 1974, Ser. No. 524,500
Int. Cl.² E05B *73/00*
U.S. Cl. 211—7 **14 Claims**

1. Display apparatus for merchandise mounted on cards, comprising an elongated hook member, a generally planar vertical support for the hook, means holding the hook on the

support a plaque mounted on said hook members, said plaque in a plane generally parallel to said support generally horizontal and at right angles to the support, a plurality of cards mounted on said hook member, an elongated bracket, extending in a direction generally perpendicular to said plane of said support, one end of said bracket mounted on said plaque, the hook and bracket terminating in free ends adjacent to each other, a pivotable cover on the bracket, the cover being coextensive with the bracket and the hook, means hinging the movable cover along the bracket, said cover having one position in close association with the hook and the top edges of said cards and a pivoted position freeing the same, the cards and cover being constructed and arranged to allow removal of the cards from said hook only upon the movement of said cover to card freeing position, and means on said bracket temporarily securing said cover in locked position adjacent to the top edges of said cards.

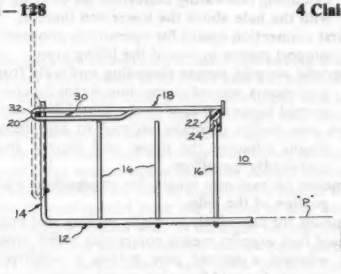


3,934,728

DISHWASHER RACK

Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 15, 1974, Ser. No. 514,377
Int. Cl.² A47F 5/13
U.S. Cl. 211—128 **4 Claims**



1. In a rack assembly for an automatic dishwasher having a base rack lying in a generally horizontal plane, a first side portion, and upstanding spaced-apart rack fingers, the improvement comprising:

a secondary rack having a first side portion connected by a slidable pivot arrangement to the first side portion of the base rack and being pivotally and slidably movable between a first position at which the secondary rack extends substantially perpendicularly to the plane of the base rack and a second position at which the secondary rack overlies the horizontal plane of the base rack in parallel alignment therewith; and

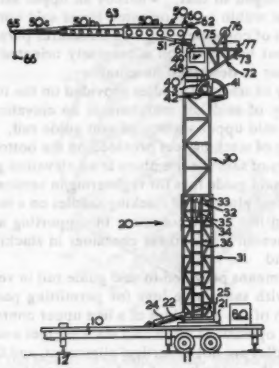
holding elements for securing the secondary rack to said fingers and supporting said secondary rack in said horizontal position overlying said base rack.

3,934,729

TOWER CRANE

Donald E. Wellman, Komoka, Canada, assignor to General Crane Industries Limited, London, Canada

Division of Ser. No. 144,199, May 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 818,751, April 23, 1969, abandoned. This application Aug. 21, 1974, Ser. No. 499,417
Claims priority, application Canada, Apr. 9, 1969, 48201
Int. Cl.² B66C 23/62
U.S. Cl. 212—46 A **3 Claims**



1. A mobile tower crane, comprising mobile platform means carrying in combination a base mounting for a tower, a tower pivotally connected to said mounting for tilting movement between a vertical operating position and a substantially horizontal travelling position in which travelling position the tower is supported by said mobile platform means, and raising means interconnecting the platform means and the tower for moving the tower between said positions, said combination being such that the tower when raised provides a firm support suitable for supporting a jib structure which is rotatable relative to the tower about the tower axis and which thereby in operation causes bending moments to be applied to said tower in various directions; and a jib structure carried by said tower which structure includes jib and jib support means, said jib support means including a turntable mounted at the top of the tower and means for rotating said turntable to cause slewing of the jib support means about the tower axis, a jib pivot mounting said jib on said jib support means to allow luffing movement thereof, and first hydraulic cylinder means connected between said jib support means and said jib for causing said luffing movement; wherein there is provided a tiltable unit carrying the jib pivot which unit is pivotally connected to the tower, and second hydraulic cylinder means connected to said tiltable unit for causing pivoting thereof between an operating position and a folded position, in which operating position, with the tower vertical, the said first hydraulic cylinder means is capable of luffing the jib between a raised position in which it forms an extension of the tower and a lowered position in which the jib forms a substantial angle of between about 60° and 90° with the tower axis, and in which the said second hydraulic cylinder means is capable of tilting said tiltable unit through an angle equivalent to said substantial angle, whereby the jib may be folded alongside the tower by operating said first cylinder means to lower the jib, and subsequently operating said second cylinder means to tilt the tiltable unit through said substantial angle, and wherein the relationship between the pivotal connection connecting the tiltable unit to the tower and the jib pivot is such that the jib lies close to the tower when the tiltable unit is in its folded condition.

3,934,730

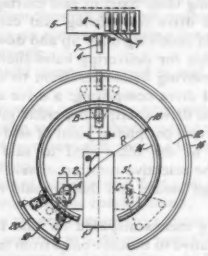
APPARATUS FOR TRANSPORTING ARTICLES ALONG CURVED HORIZONTAL PATH WHILE MAINTAINING ORIENTATION CONSTANT

John A. Pershing, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 2, 1971, Ser. No. 204,047The portion of the term of this patent subsequent to Sept. 27, 1991, has been disclaimed.

Int. Cl.[2] B65G *47/24*

U.S. Cl. 214—1 BH 9 Claims



1. Apparatus for horizontally transporting an article from any of a number of delivery stations lying along a horizontal curvilinear path to a receiving station while controlling the orientation of the article about a vertical axis with respect to the receiving station, comprising:

an elevated track which follows a horizontal curvilinear path passing over the delivery and receiving stations;

a carriage supported from the track;

a holder for fixably holding the article, the holder being rotatably supported from the carriage for rotation about a vertical axis;

means mounted on the carriage for raising the holder to lift the article from a delivery station and for lowering the holder to deposit the article at the receiving station;

means for moving the carriage along the curvilinear track while angularly changing its orientation about a vertical axis;

and means responsive to the angular change in orientation of the carriage as it moves along the curvilinear track for rotating the holder to maintain the article at all times in fixed angular relationship with respect to the receiving station.

3,934,731

APPARATUS FOR INSPECTING AND REPAIRING A PRESSURIZED-WATER REACTOR'S STEAM GENERATOR HEAT EXCHANGER TUBES

Otto Müller, Spardorf; Hans Röttger, Weiher; Hans Kastl, Neustadt, a.d. Waldnaab, and Hans-Günter Hagen, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

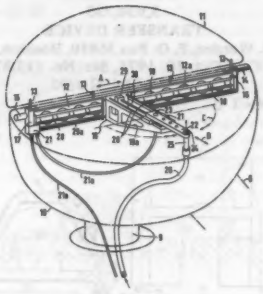
Filed Dec. 20, 1973, Ser. No. 426,483

Claims priority, application Germany, Dec. 22, 1972, 2264143

Int. Cl. F28g *15/02*

U.S. Cl. 214—1 BB 9 Claims

1. An apparatus for use with a pressurized-water reactor's steam generator having a manifold chamber enclosing the bottom side of a horizontal tube sheet having holes therethrough in which are mounted the tubes of a heat exchanger tube bundle which extends upwardly from the tube sheet's top side, said chamber having a manhole giving access to said tube sheet's bottom side to permit internal inspection or repair of said tubes by registration of an end of a flexible guide conduit with said holes and through which a flexible carrier can be guided for insertion via said holes through the tubes extending from the tube sheet's other side; said apparatus including a fixture insertable through said access opening and comprising a beam, means for detachably supporting said beam horizontally in said chamber beneath said tube sheet's bottom side, a horizontal cantilever arm having one end provided with means for supporting said guide conduit with its end pointing upwardly, and means for mounting the other end of said arm on one side of said beam and means for horizontally moving the end of said arm having said supporting means relative to said beam, whereby said guide conduit may be aligned with said holes in said tube sheet.



3,934,732

OBJECT TRANSFER MACHINE

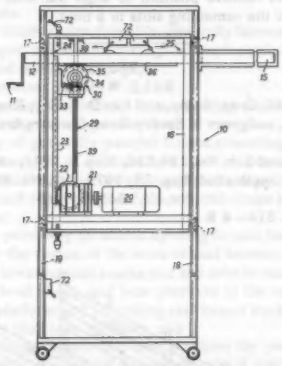
Arnold Chambers, Chesterfield, England, assignor to Glass Tubes and Components Limited, Chesterfield, England

Filed July 22, 1974, Ser. No. 490,697

Claims priority, application United Kingdom, Aug. 9, 1973, 37844/73

Int. Cl.[2] B23Q *7/04*

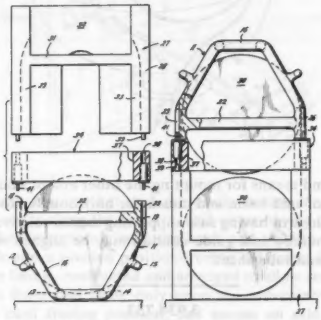
U.S. Cl. 214—1 BB 5 Claims



1. A machine for transferring objects from one work station to another, comprising an object carrier guided for vertical and horizontal movements, a first reversible drive means for raising and lowering the object carrier, a second reversible drive means for moving the object carrier horizontally to and fro, and mechanism for controlling the operation of the two reversible drive means, the control mechanism including a motor, a plurality of gears driven by said motor, said gears being in mesh with one another to form a gear train, and a bank of control cams, each of said control cams being fast with a respective one of said gears to be driven through a control cycle, each of the cams being operably connected to a selected one of said first and second drive means to cause

said selected drive means to operate for a predetermined period, and the cam arrangement being such that the two drive means cause the object carrier to move through a set sequence of vertical and horizontal movements during each control cycle.

3,934,733
TRANSFER DEVICE
Raymond D. Worden, P. O. Box 36010, Houston, Tex. 77036
Filed Oct. 10, 1974, Ser. No. 513,878
Int. Cl.² B65G 3/00
U.S. Cl. 214—1 Q **3 Claims**



3. A transfer adapter for transferring discs from a boat to a carrier comprising,

a rectangular body having a plurality of alternate slots and lands extending therethrough,

and means on said body for engaging a boat to align the adapter and boat one relative position with the slots in the adapter aligned with alternate slots in a boat and in another relative position to align the slots in the adapter with the remaining slots in a boat.

3,934,734
BALE WAGON
Donald M. Grey, Selma, and Lee D. Butler, Kingsburg, both of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.
Division of Ser. No. 139,324, May 3, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,971
Int. Cl.² B65G 57/32
U.S. Cl. 214—6 B **6 Claims**

1. A bale wagon adapted for loading and unloading bales of hay or the like, comprising in combination:

a load rack for supporting a stack of bales, said stack being comprised by side-by-side tiers;

a generally upright transfer table normally disposed in a first position spaced forwardly of said load rack and movable between said first position and a second position in which said transfer table is disposed adjacent a front end of said load rack for delivering said tiers in succession to said load rack during loading and for receiving said tiers in succession from said load rack during unloading;

a carriage means disposed below said transfer table and adjacent said front end of said load rack;

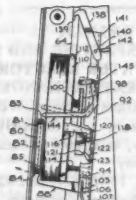
a bale receiving table fixed to said carriage means;

a mechanical drive for moving said carriage means and thereby said receiving table up and down relative to said transfer table for delivering bales thereto to load bales and for receiving bales therefrom to unload bales, said mechanical drive comprising: a drive shaft, a drive disc fixed to said drive shaft, and a crank pivotally connected at one end to a peripheral point of said disc and pivotally connected at the other end to said carriage means, whereby the selective rotation of said drive shaft cycles said carriage means and thereby said receiving table up and down;

bale retaining means disposed on said transfer table and being operative to transfer bales from said receiving table to said transfer table to form said tier of bales thereon during loading when said transfer table is at its first position and to transfer bales from said transfer table to said receiving table during unloading when said transfer table is at its first position, said retaining means further being operative to transfer a tier to the front end of said load rack from said transfer table upon the movement of said transfer table to said second position during loading and to transfer a like tier from the front end of said load rack to said transfer table upon the movement of said transfer table to said second position during unloading; and

conveying means disposed adjacent said receiving table for carrying bales received thereon from said wagon.

3,934,735
DAYLIGHT FILM HANDLING SYSTEM
Gunter Schmidt, Malibu, Calif., assignor to Productron, Inc., Los Angeles, Calif.
Division of Ser. No. 52,848, July 7, 1970, Pat. No. 3,790,160. This application Sept. 27, 1973, Ser. No. 401,441
Int. Cl.² B65G 57/00
U.S. Cl. 214—6 D **8 Claims**



1. Apparatus useful for dispensing film sheets into a cassette, each sheet having a notch extending inwardly from an edge thereof, one at a time from a stack of such sheets, said

stack being comprised of alternate odd and even sheets with the notch in all of said odd sheets being aligned in a first row and the notch in all of said even sheets being aligned in a second row, said apparatus comprising:

a housing having an exit opening adapted to accommodate said stack therein;

first cam means in said housing for engaging said stack in alignment with said first row of notches;

second means in said housing for engaging said stack in alignment with said second row of notches;

means for alternately disengaging said first and second cam means from said stack to successively release one sheet at a time therefrom through said exit opening;

a cassette having an entrance opening for receiving a film sheet therethrough;

cassette light shield means disposed in said entrance opening;

means on said housing removably engagable with said cassette for opening said light shield means to permit a film sheet released from said exit opening to pass through said entrance opening;

said first cam means comprising a first cam member eccentrically secured to a first rotatable rod;

said second cam means comprising a second cam member eccentrically secured to a second rotatable rod; and

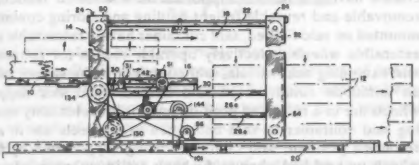
said means for alternately disengaging said first and second cam means including means for alternately rotating said first and second rods.

3,934,736

SPRING STACKER

Kenneth H. Thomas, Oxford, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Aug. 28, 1974, Ser. No. 501,032
Int. Cl.² B65G *57/14*
U.S. Cl. 214—6 FA **2 Claims**



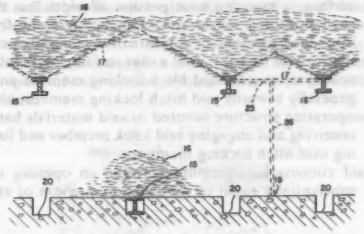
1. Apparatus for stacking spring assemblies produced on a spring assembly machine, comprising in line with the discharge side of the spring assembly machine, transfer means for receiving assemblies one by one from the spring assembly machine and a dolly upon which the transfer means deposits the assemblies one by one in a stack, said transfer means comprising a table supported at the discharge side of the assembly machine, said table being comprised of telescoping parts for adjusting the width of the table for springs of different widths, means arranged along opposite sides of the table and movable along the table for engaging and drawing an assembly forwardly along the table to a predetermined position, lifting means situated at opposite sides of the table below the level of the top of an assembly resting on the table at an initial position substantially midway between the leading and trailing ends of the assembly, said lifting means being movable upwardly relative to the sides of the assembly to engage and lift the assembly from the table, move the assembly forwardly to a position above the dolly, lower the assembly onto the dolly and return the lifting means to said initial position, means for ejecting the dolly when a predetermined number of assemblies are stacked thereon, and a counter actuated by return of said lifting means to said initial position to count the number of assemblies and when said predetermined number of assemblies is reached to effect operation of the means for ejecting the dolly.

3,934,737

METHOD AND APPARATUS FOR SILO STORAGE AND UNLOADING

Edward H. Cumpston, Jr., 43 Monument Ave., Old Bennington, Vt. 05201

Filed Jan. 15, 1975, Ser. No. 541,282
Int. Cl.² B65G *65/64*
U.S. Cl. 214—16 R **10 Claims**



1. A method of unloading feltable, non-flowable, generally laminar materials such as paper, cardboard, corrugated cardboard, and thin wood chips from a storage silo elevated above a base platform and having a plurality of vertically movable cross beams normally held at a level above said base platform in the bottom region of said silo for supporting said material in said silo, said method comprising:

a. lowering one of said beams to the region of said base platform to lower a portion of said material above said lowered beam, said material above said lowered portion of said material being self-supporting in a general arch shape upheld by ones of said beams other than said lowered beam;

b. moving said lowered portion of said material from said base platform and out from under said arch of said material above said lowered beam; and

c. raising said lowered beam back to said level of said plurality of beams.

4. A silo for feltable, non-flowable, generally laminar materials such as paper, cardboard, corrugated cardboard, and thin wood chips, said silo comprising:

a. a base platform;

b. walls extending above said base platform and substantially enclosing a storage chamber;

c. a plurality of generally parallel beams extending across the bottom region of said silo at a level above said base platform, said material being supported on said beams and being self-supporting in a general arch shape between said beams;

d. said walls providing an access opening to said base platform from the region of the ends of said beams;

e. means for lowering said beams one at a time in succession from said level above said base platform to the region of said base platform and for raising said beams back to said level above said base platform; and

f. means for moving from said base platform the portion of said material lowered by lowering each of said beams while the remainder of said material is self-supported in a general arch shape upheld by ones of said beams other than a lowered one of said beams.

3,934,738

TOOL CONNECTING

Carroll H. Arnold, Westminster, Mass., assignor to Wain-Roy, Inc., Hubbardston, Mass.

Filed Apr. 1, 1974, Ser. No. 456,523
Int. Cl.² E02F *3/70*
U.S. Cl. 214—145 A **36 Claims**

1. Apparatus for releasably securing a materials handler to a boom while permitting rotation of said materials handler

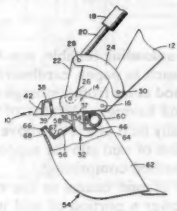
about a first axis fixed with respect to said boom, said apparatus comprising:

a hitch adapted for pivotal connection to said boom for rotation about said first axis and including a hitch body, a hook member of predetermined maximum width projecting outwardly from said body, and a hitch locking member spaced from said hook member in a direction generally perpendicular to said first axis,

said hook member defining a jaw having a jaw engagement surface, a tapering nose portion of width less than said predetermined maximum width facing away from said hitch locking member in a direction generally perpendicular to said first axis, and a rear surface intermediate said nose portion and said hitch locking member and facing generally towards said hitch locking member; and,

cooperating structure secured to said materials handler for receiving and engaging said hook member and for engaging said hitch locking member,

said cooperating structure defining an opening of width substantially equal to said maximum width of said hook



member for receiving said hook member, a cooperating structure locking member spaced from said opening on one side thereof for engaging said hitch locking member, and a rigid crossmember extending transversely the width of said opening adjacent the side thereof opposite said cooperating structure locking member for engaging said jaw engagement surface when said hook member is inserted within said opening,

the overall depth of said hook member being defined by said rear surface and the end of said nose portion most distant therefrom,

the length of said opening being defined by one surface intermediate said rigid cross-member and said cooperating structure locking member and facing generally towards said cross-member, and a second and generally oppositely facing surface on the side of said one surface opposite said cooperating structure locking member,

said length of said opening being less than the distance from said jaw engagement surface to said hitch locking member.

3,934,739

SELF-ERECTING SURGE STORAGE SYSTEM

D. Bruce Zumsteg, Glasgow; Gino Origlia, Columbia, and J. T. Odom, Glasgow, all of Mo., assignors to Standard Havens, Inc., Kansas City, Mo.

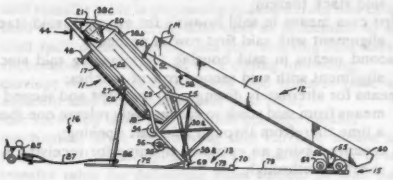
Filed Feb. 13, 1974, Ser. No. 442,127
Int. Cl.² B60P 1/64
U.S. Cl. 214—501 **9 Claims**

1. A portable, self-erecting storage system comprising:

a storage bin including a large volume tank and a supporting frame therefor, said bin positionable in a substantially horizontal position and in a vertical, operational position;

a foundation structure underlying said storage bin in ground engaging fashion and providing a pivotal connection with said bin, said pivotal connection defining a horizontal pivot axis;

power means including a pair of extendable hydraulic cylinders pivotally connected to said bin and said foundation structure on each side of said bin to pivot said bin on said horizontal pivot axis from the horizontal position to the operational position and from the operational position to the horizontal position; and



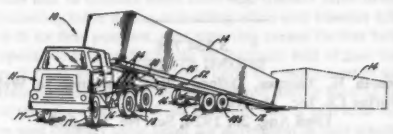
visual indicating means connected to said storage bin to detect and indicate the torsional condition of said bin during the pivotal raising and lowering thereof.

3,934,740

TRANSPORT VEHICLE WITH TILTABLE CHASSIS

James A. Rumell, 1955 Vermont, Blue Island, Ill. 60406

Filed Oct. 29, 1973, Ser. No. 410,344
Int. Cl.² B60P 1/04
U.S. Cl. 214—505 **18 Claims**



1. A transport vehicle comprising a tractor, a chassis releasably attached to said tractor for transport therewith, said chassis having a flatbed supported on a wheeled tandem, a removable and reusable freight hauling and storing container mounted on said flatbed, said container having retractable and extensible wheels, selectively operable means for retracting and extending said wheels, said container being supported in an immobile condition on said flatbed when said support wheels are in a retracted position, means for releasably securing said container to said bed when said wheels are in said retracted position, said container being supportable by said wheels on said bed when said wheels are in an extended position for longitudinal rolling movement with respect to said flatbed, said tandem supporting said flatbed for relative sliding and tilting movement, means for selectively positioning said flatbed longitudinally relative to said tandem, pivot means on said tandem for pivotably supporting said flatbed and about which said flatbed pivots regardless of the relative longitudinal position of said flatbed to said tandem, and means connected between said chassis and flatbed for tilting said flatbed relative to said tandem to permit removal of said container longitudinally off the end of said flatbed.

3,934,741

TELESCOPIC LOAD TRANSFER DEVICE

Edward A. Wentz, Gaithersburg, Md., assignor to American Chain & Cable Company, Inc., Briedgeport, Conn.

Division of Ser. No. 198,917, Nov. 15, 1971, Pat. No. 3,792,758, which is a continuation of Ser. No. 840,667, July 10, 1969, abandoned. This application Dec. 11, 1972, Ser. No. 314,159
Int. Cl.³ B66F 9/14
U.S. Cl. 214—730 **2 Claims**

1. A stacker crane tray mechanism comprising a tray and movable support means therefor, said support means comprising a plurality of pairs of telescopically articulated beams;

one beam pair being attached to said tray and one other beam pair being relatively fixed and with respect to which

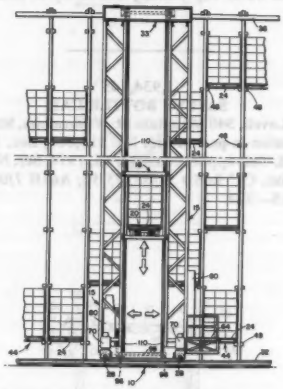
fixed beam pair all other beam pairs are telescopically movable;

the beam pairs intermediate said fixed beam pair and the beam pair attached to said tray having guide channels at one face thereof and guide rollers at the other face thereof;

wherein all said beam pairs are telescopically connected by rollers of beam pairs extending into guide channels of immediately adjacent beam pairs;

drive plates in superimposed array and secured to respective beam pairs for effecting telescopic movement thereof and having central nested channels;

drive chain means and said drive plates being sequentially coupled by said drive chain means so that driven movement of a first of said drive plates effects progressively extended movement of the remainder of said drive plates and the respective beam pairs, to drive said tray;



said drive plates being reversibly movable;

and hydraulic drive means comprising a plurality of double acting hydraulic cylinders secured in pairs, one pair being connected to another pair by connection of a piston rod of each of said pairs to each other;

the cylinders of each pair being connected to each other and the respective rods thereof extending in opposite directions and;

said cylinders and pistons being disposed in the lowermost drive plate channel;

means whereby the other piston rod of one of said pairs has an end relatively fixed with respect to said relatively fixed beam pair and the other piston rod of the other of said pairs is drivingly connected to said first drive plate;

whereby selective pressurization of said cylinders effects motion of one or both of said piston rods to actuate said first drive plate to a selective extent and in a direction dependent upon direction of pressurization of said cylinders.

3,934,742

VALVE MECHANISM FOR AUTOMATIC CONTROL OF A NUMBER OF FLUID MOTORS

Francis H. Tennis, Oconomowoc, Wis., assignor to Hydraulic Industries, Inc., Hartland, Wis.

Filed Dec. 26, 1973, Ser. No. 427,806

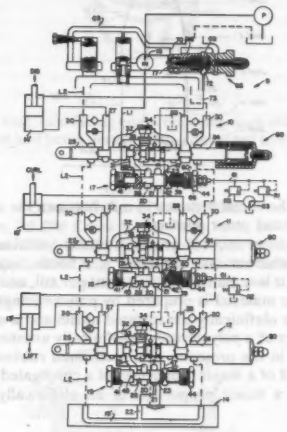
Int. Cl.[2] E02F *3/28*; F15B *13/06*

U.S. Cl. 214—762 **11 Claims**

1. Means for governing operation of first and second hydraulic motors each of which has a work performing element for connection with a load and an operating port to which pressure fluid can be delivered to effect actuation of the load, characterized by:

A. respective first and second motor control valves, each having a service port connected with the operating port of its motor, and a valve spool movable to a working position at which it communicates said service port with a pressure fluid supply port common to said valves;

B. a flow control mechanism connected with said control valves; through which pressure fluid from said common supply port must flow to reach the operating port of each motor, said mechanism having a valve member movable from a first position providing for flow of supply fluid to the operating port of said first motor to a second position obstructing such flow and providing for flow of supply fluid to the operating port of the second motor providing the spool of said second control valve is in its working position;



C. means to hold said flow control valve member in its said first position in response to the pressure of fluid present in the service port of said first control valve in said working position of the spool thereof;

D. means so interlinking said work performing elements that the load on the first motor can be reduced in consequence of movement of said flow control valve member to its second position at times when said valve spools are concurrently in their working positions;

E. and means rendered operative in consequence of and whenever the load on the first motor causes pressure at the service port of the first control valve to rise to a predetermined high value at said times when both spools are in their working position, for effecting actuation of said flow control valve member to its second position to thereby automatically provide for reduction of the load on the first motor.

3,934,743

BLOW MOLDED, ORIENTED PLASTIC BOTTLE AND METHOD FOR MAKING SAME

Charles Edmund McChesney, Monmouth Junction; Robert J. McHenry, Belle Mead, and James Alan Wachtel, Princeton, all of N.J., assignors to American Can Company, Greenwich, Conn.

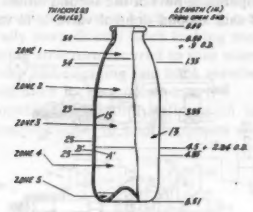
Filed Dec. 29, 1972, Ser. No. 319,380

Int. Cl.[2] B65D *23/00*; B32B *7/02*

U.S. Cl. 215—1 C **35 Claims**

1. A self-supporting biaxially oriented plastic container blow molded from a parison across the thickness of its sidewall an outwardly radially decreasing temperature gradient within the orientation temperature range of and made from a glassy, essentially non-crystalline thermoplastic polymeric material which is capable of being biaxially oriented during blow mold-

ing, said container having a tubular sidewall with inner and outer surfaces, said sidewall having inner, middle and outer portions and being characterized in that in an axial zone thereof the percentage variation of the circumferential orientation release stress from said inner portion to said outer portion is less than about 4% per mil of sidewall thickness, said percentage variation being determined by multiplying 100 by a fraction in which the numerator is the difference between the orientation release stresses at said inner and outer portions and in which the denominator is the average of the orientation release stresses in said inner, middle and outer portions multiplied by the radial distance in mils between the centerlines of the inner and outer portions.



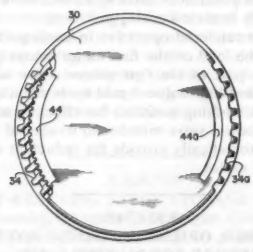
8. The blow molded oriented plastic container claimed in claim 1 wherein said container is a bottle, said percentage variation is less than about 3 percent per mil, and wherein said polymeric material is prepared by polymerizing a major portion of an olefinically unsaturated nitrile and a minor portion of an ester of a polymerizable olefinically unsaturated carboxylic acid in the presence of a preformed rubbery copolymer composed of a major proportion of a conjugated diene monomer and a minor proportion of an olefinically unsaturated nitrile.

3,934,744

CLOSURE ASSEMBLY

John Joseph Curry, Westchester, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,904
Int. Cl.² B65D *55/02*, *85/56*; A61H *1/00*
U.S. Cl. 215—219 **4 Claims**



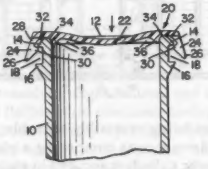
1. An outer cap for association as a safety overcap for a standard metal closure cap of the type having a relatively flat top wall and a depending skirt with knurling on the upper edge portion of said skirt and with threads in said skirt below said knurling and with an outwardly rolled rim at the lower edge portion of said skirt for threading of said closure cap onto complementary thread-like formations on a container neck portion for closing the same, said outer cap being formed of a resilient plastic material and comprising a top wall to overlie the top wall of the closure cap and a depending skirt of sufficient height to completely encircle the skirt of the closure cap, and a radially inwardly extending flange integrally formed on the lower edge of said depending skirt of said outer cap for trapping the outer cap on the closure cap, the upper portion of the inner wall of said skirt of said outer cap having a diameter larger than the diameter of a circle through the tips of said knurling on said closure cap, said upper portion of said inner wall of said skirt of said cap having two integrally formed teeth segments which are diametrically disposed to each other, the tips of said teeth segments lying on a circle of a diameter greater than the diameter of said circle through the tips of said knurling on said closure cap, the top wall of said outer cap being formed to have two arcuate slots therethrough which are diametrically disposed to each other and immediately radially inwardly of said two teeth segments and in substantially circumferential alignment with said two teeth segments, and said teeth segments having tooth profiles capable of mechanically interlocking with said knurling on said closure cap when said outer cap is mounted on said closure cap and a person squeezes opposed upper outer wall portions of said skirt of said outer cap radially outwardly of said teeth segments.

3,934,745

SAFETY BOTTLE CAP

Walter C. Lovell, 348 Mountain St., Wilbraham, Mass. 01095

Continuation-in-part of Ser. No. 315,608, Dec. 15, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,170
Int. Cl.² B65D *55/02*, *85/56*; A61H *1/00*
U.S. Cl. 215—224 **2 Claims**



1. A safety closure for a bottle, said bottle having an open rim defined by a lip, said lip having an outwardly extending portion, a complementary lip in spaced relation to the outwardly extending portion of the first named lip, said lips defining a groove between them, said first named lip having a reaction surface at the inner side of the bottle, opposite the outwardly extending portion of the first named lip,

the closure comprising a cap of a deformable resilient and substantially self-sustaining plastic material including a main closed portion in the form of a dome, an inwardly inclined flange depending therefrom at the periphery thereof, said flange being constructed and arranged to snap over the first named lip to enter the groove to close the bottle,

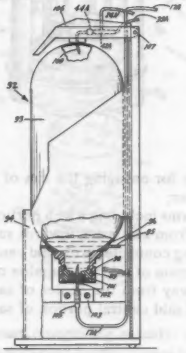
a series of slots in the flange in mutually spaced relation circumferentially of the flange providing for expansion of the flange upon pressure downwardly applied to the dome to a position wherein the flange substantially clears the outwardly extending portion of the first named lip,

and a downwardly extending generally circular ridge at the inside portion of said cap, said ridge being spaced inwardly from the flange and forming a fulcrum, said fulcrum normally bearing on said reaction surface and causing the flange to pivot outwardly upon the application of the downward pressure on the dome aforesaid.

3,934,746
FLUID PRODUCT RESERVOIR

Duane F. Lilja, 2410 Central Ave. NE., Minneapolis, Minn. 55418

Continuation-in-part of Ser. No. 413,768, Nov. 8, 1973, Pat. No. 3,841,555. This application Oct. 7, 1974, Ser. No. 512,523
Int. Cl.² B65D 47/36
U.S. Cl. 215—232 17 Claims



1. A fluid product reservoir comprising:
a closed container having an open neck portion with interior walls defining an open throat;
an interior, outwardly facing ledge integral with said interior walls of said throat;
a plug located in said throat having outer walls closely conforming to the interior walls of said neck portion to close the neck portion;
said plug having a peripheral, inwardly facing ledge in mating contact with the outwardly facing ledge in said throat;
the end portion of said neck being attached to the end of said plug to secure said plug in said throat;
a lip on said plug extending inwardly from the inwardly facing ledge of said plug, said lip being tapered inwardly and toward the center line of said container making biasing, frictional contact with said outwardly facing ledge of the throat to at least partially form a seal;
said plug having a central opening;
an elastically penetrable insert sealably located in said central opening of said plug.

3,934,747
CONTAINER, PARTICULARLY FOR LIQUIDS

Jan Henrik Needt, Oosterhout, North Brabant, Netherlands, assignor to Wiva N.V., Rotterdam, Netherlands

Filed Sept. 6, 1974, Ser. No. 503,908
Claims priority, application Netherlands, Sept. 10, 1973, 12477
Int. Cl.² B65D 1702
U.S. Cl. 220—5 R 8 Claims

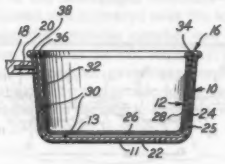
1. A container comprising at least two coaxial shell parts arranged end-to-end and made of synthetic moldable material, each shell part having a ring concentric with its respective shell part and connected to a peripheral edge of its respective shell part, the ring of each part having an edge facing an edge

of the other ring, said facing edges engaging each other in only a single plane and being permanently connected to each other.

3,934,748
COOKWARE CONTAINERS

Nick S. Racz, 25 Old Creek Road, Palos Park, Ill. 60464

Continuation of Ser. No. 242,325, April 10, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,309
Int. Cl.² B65D 25/18, 25/14, 25/34
U.S. Cl. 220—9 R 28 Claims



1. In a cookware unit including a container, said container comprising:
durable heat conductive cartridge means having heat conductive walls arranged in a predetermined configuration defining a cavity therein which is liquid-free, said walls conducting heat from a heat source to said liquid free cavity,
infix means also having walls arranged in substantially the same said predetermined configuration and sealingly positioned in the cavity of said cartridge means, said infix means walls also being heat conductive and defining a cavity therein for receipt of the food which is to be prepared in said container, said walls conducting heat to the food from said liquid-free cavity of said cartridge means, the walls of said cartridge means and said infix means being substantially dissimilar in at least one of composition and thickness such that the strength of said cartridge means is substantially greater than the strength of said infix means, and a heat bonded non-stick coating suited for food contact on said infix means coating the food contacting surfaces of said infix means cavity, and
fastening means attaching said infix means into said liquid free cavity of said cartridge means to thereby define an integral container at all times during cooking use and cleaning of said container, said fastening means together with the walls of said cartridge means and infix means defining sealing means to prevent the passage of matter to and from said liquid free cavity of said cartridge means at all times during cleaning and cooking use of the container, but allowing said durable cartridge means and

infix means to be separated when said container is not in use for replacement of said non-stick coated infix means with new infix means when the non-stick coating of said non-stick coated infix means has deteriorated.

3,934,749

PLASTIC CONTAINER

Algis Steven Andrulionis, Fairfield, Conn., assignor to Polysar Plastics, Inc., Middletown, N.Y.

Filed Sept. 11, 1974, Ser. No. 504,884
Int. Cl.² B65D 25/14
U.S. Cl. 220—63 R 9 Claims

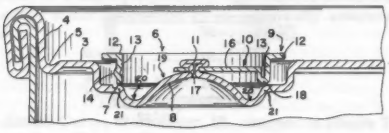
1. A covered plastic container comprising a body wall and closed bottom end and sealed to a rim of the upper end of the body wall a plastic laminate cover comprising an inner plastic layer sealed to said rim of said upper end of the body wall thereby forming a hermetic seal and weakly adhering to the outer surface of said inner plastic layer and at least one outer plastic layer which is separable from said inner layer, said at least one outer plastic layer being so shaped and formed as to act as a press-on lid for said container when separated from said inner plastic layer, said inner plastic layer and said at least one outer plastic layer being originally formed as a laminate cover.

3,934,750

NON-DETACHABLE END UNIT

Edward J. Herbst, Posen, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 521,995
Int. Cl.² B65D 41/02
U.S. Cl. 220—277 10 Claims



1. An improved non-detachable end closure for a can or similar container comprising an end panel having a chuck wall joined to a body by a chime, said end panel being formed with a well in an area between the end panel center and said chuck wall, said well having a substantially vertical sidewall and a base, and a score formed in said base, defining and partially encircling an opening flap, said flap being formed as an outwardly projecting dome with a peripheral depression thereabout, said depression being defined by a U-shaped contour of said end panel and having a portion at one side merging into said dome and having another portion at its opposite side merging into said base.

3,934,751

SAFETY OVERCAP FOR DISPENSING CONTAINERS

Edward H. Green, and Edward H. Green, Jr., both of 57 Interstate Road, Addison, Ill. 60101

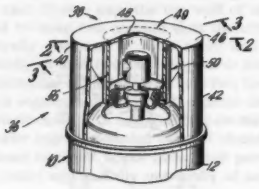
Continuation-in-part of Ser. No. 498,440, Aug. 19, 1974, which is a continuation of Ser. No. 352,555, April 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 254,191, May 17, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 535,097
Int. Cl.² B67B 5/00; B65D 55/02; B67D 5/32
U.S. Cl. 220—306 18 Claims

1. A safety overcap for a dispensing container having a cup member supporting dispensing means for dispensing a product stored in the container and including a protruding rim, said overcap comprising

a top member have a flexible central portion, an annular portion and a peripheral edge;

a skirt depending from said peripheral edge of said top member; and

a plurality of spaced arms depending from said top member internally of said skirt, the lower portion of said arms having locking means, including an inwardly extending



end portion for engaging the rim of the cup member of the container;

each of said arms including a web portion extending radially outwardly from said arms towards said skirt; and

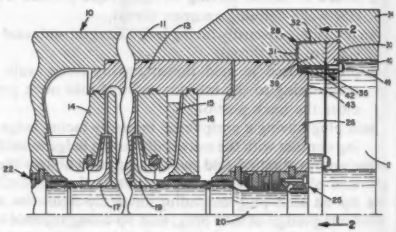
said arms being connected with said central portion and said annular portion of said top member of said overcap to be movable away from the center of said overcap with depression of said central portion of said top member.

3,934,752

END WALL CLOSURE APPARATUS

Donald P. Ravicchio, Appolo, and Carl H. Geary, Greensburg, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 17, 1974, Ser. No. 434,167
Int. Cl.² B65D 45/00
U.S. Cl. 220—328 4 Claims



1. Apparatus for supporting an end wall closure structure within an opening formed in the casing of a pressure vessel including

a shear key seated within a groove formed in the interior wall of the opening provided within the casing with a portion of the shear key extending inwardly beyond the interior wall of the casing and being received with a complementary shoulder formed within the outer face of the end wall closure structure, and

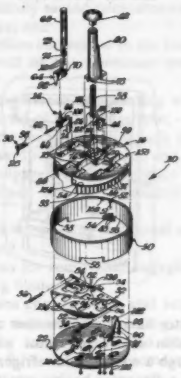
a pair of raised moment control pads carried upon the shear key and being arranged to act against one radial side face and the bottom wall of said groove in the casing, the control pads being located in regard to the center of gravity of the shear key so that the reactive bending moments translated by the end wall to said key are offset by the bending moments translated by the casing to said shear key whereby the sum of the moments acting about the key are substantially negated.

3,934,753

DISC DISPENSER WITH REMOVABLE MAGAZINES

Alan C. Curtiss, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 29, 1974, Ser. No. 437,700
Int. Cl.² B65H 3/44
U.S. Cl. 221—93 32 Claims



25. A disc dispenser comprising a body, a slot extending through said body, a socketed funnel in said body intersecting said slot, a tubular chute in said body intersecting said slot adjacent and spaced from said socketed funnel, a slide carriage having a slide plate disposed in said slot for sliding movement therein, the chute end of said plate having an aperture for receiving said discs, said chute end of said slide plate being thinner than the funnel end thereby providing a thin shouldered end on said plate containing said aperture whereby discharge of said discs from said funnel into said aperture is facilitated, resilient means urging said slide carriage to the loaded position in which said aperture is disposed below said socket, an actuating pin on said slide carriage whereby actuating movement is imparted to it for moving a disc loaded in said aperture over and into said chute, and said top of said tubular chute is open to permit the discharge of discs through said chute to be visually verified.

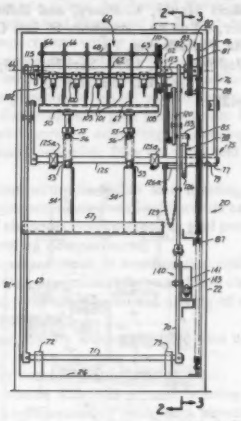
3,934,754

DEVICE FOR ISSUING SINGLE UNITS OF FLAT FLEXIBLE ARTICLES

Lyle V. Dutro, 1908 Meadowbrook, Altadena, Calif. 91001

Filed Jan. 28, 1974, Ser. No. 436,834
Int. Cl.² B65H 3/22
U.S. Cl. 221—213 44 Claims

1. In a vending machine for issuing a single article from a stack of such articles, stripper means for stripping an end article from said stack, the article to be issued having an exposed face, and the stripper means comprising: a rotatable member having an axis of rotation and a direction of rotation when the article is being removed by it from the stack, an abutment surface on the rotatable member radially spaced from said axis, means for rotating the rotatable member and for simultaneously moving it laterally in a path across the stack, whereby to traverse the exposed face from adjacent one edge thereof, engagement means pivotally mounted to the rotatable member, said engagement means comprising an elongated pointed article-engaging element having a point and a piercing axis, and and extended engaged and a retracted disengaged condition in which the point is respectively radially outside of and inside of the abutment surface, the piercing axis of the engagement means making an acute angle with the exposed face of the article when extended and engaged thereto, with the piercing axis facing in the direction of rotation, whereby the article-engaging elements can be engaged to the article near said edge in the engaged condition, and while engaged to an article, the rotatable member may be simultaneously rotated and moved laterally across the face of the stack so as to wrap the article against the abutment surface with the article held to the rotatable member as a consequence of the said angularity of the said piercing axis, and strip it from the stack, and whereby the engagement means



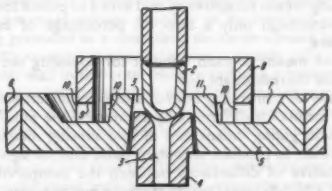
may be placed in the disengaged condition to permit said article to be released and delivered over the top of the rotatable member, and the rotatable member can be returned to the initial position to repeat the said sequence, and stop means fixed to the rotatable member, projecting beyond its abutment surface, to be abutted by the article to be stripped so as to align the same at the time the article-engaging elements pierce the article.

3,934,755

METHOD AND DEVICE FOR PREVENTING SLAG FROM ESCAPING WHEN EMPTYING A POURING VESSEL

Paul Rheinlander, and Heinz Voigt, both of Wolfenbuttel, Germany, assignors to Thermo-Industrie GmbH & Co. KG, Bruchtorwall, Germany

Filed Apr. 3, 1974, Ser. No. 457,630
Claims priority, application Germany, Apr. 4, 1973, 2316757
Int. Cl.² B22D 37/00, 41/10
U.S. Cl. 222—1 12 Claims



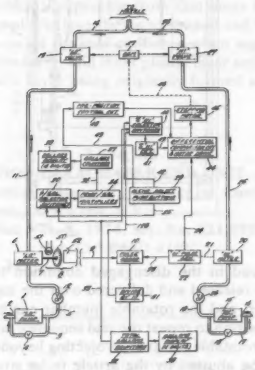
1. A method for preventing relatively lighter slag from escaping when emptying a pouring vessel containing steel of a specific weight heavier than that of slag and the relatively lighter slag in liquid form and provided with a stopper operated discharge opening in the bottom of the vessel, which includes in combination therewith the steps of providing a means for maintaining a barrier of heavier liquid steel between the relatively lighter slag and the discharge opening during the end phase of the vessel emptying operation and allowing said

means to shutoff the flow of steel through the discharge opening while maintaining the barrier of steel between the slag and discharge opening.

3,934,756
BLENDING-TYPE MOTOR FUEL DISPENSING APPARATUS

Einar T. Young, Newtown Square; Stephen M. Fromnick, Glen Riddle; Robert Mayer, Ardmore, and Robert H. Livesay, West Chester, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadephia, Pa.

Filed Mar. 27, 1974, Ser. No. 455,476
Int. Cl.² B67D 5/22
U.S. Cl. 222—28 11 Claims

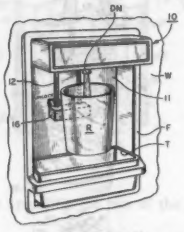


1. A system for proportioning a pair of liquids and comprising:
a. a pair of flow conduits, one for each liquid;
b. means in each conduit for sensing the flow of liquid therethrough and for providing a train of individual pulses the number of which is proportional to the integrated liquid flow rate through the conduit;
c. means for summing the two pulse trains to produce a series of pulses the total number of which is representative of the combined volumetric liquid flow through both of said conduits;
d. gating means receptive of said series of pulses for passing therethrough only a selected percentage of said such pulses;
e. valve means in each conduit for adjusting the flow of liquid therethrough; and
f. means for controlling both of said valve means and including means for differentially comparing the pulse outputs of said gating means and of said sensing means in one conduit, to produce an output pulse control signal representative of differences between the compared pulses, and a bidirectional rotary stepping motor means, responsive to said output pulse control signal, for stepping in a number of discrete steps in one rotary direction or the other to control both of said valve means to achieve a selected proportioning of the pair of liquids, and a dual control cam means mechanically coupled for rotation with said stepping motor means and having a first portion of its cammed surface controlling one of said valve means and a second portion of its cammed surface controlling the other of said valve means.

3,934,757
REFRIGERATOR WATER DISPENSER WITH CHILD-PROOF GUARD

Raymond P. Malek, Norridge, and Leroy R. Maleck, Galesburg, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Dec. 20, 1974, Ser. No. 534,838
Int. Cl.² B67D 5/06
U.S. Cl. 222—76 3 Claims

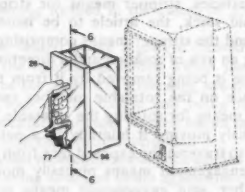


1. In a refrigerator having a connection to a fluid source for cooling fluid within said refrigerator and dispensing said cooled fluid through a wall of said refrigerator, the combination therewith of a dispenser having structure for preventing unintended dispensing of said fluid, said structure comprising:
a. discharge spout for said fluid located with reference to said wall and adapted to discharge fluid into portable receptacle held in proximity to said discharge means;
b. means controlled by movement of said receptacle determinative of discharge or cessation of said discharge comprising:
i. a power operated valve connected in said fluid source;
ii. means for controlling said vlave including a switch connected in a circuit with said valve;
iii. an actuating member supported on said structure and cooperating with said portable receptacle to actuate said control means;
c. means supported on said structure and shiftable selectively between shut-off and discharge positions, said shut-off position preventing actuation of said actuating member, said discharge position enabling said actuating member to be actuated.

3,934,758
REFRIGERATED BEVERAGE DISPENSER-MIXER

Frederick M. Kipp, 455 Beach Road, Fairfield, Conn. 06430

Filed Mar. 14, 1974, Ser. No. 451,025
Int. Cl.² B67D 5/62
U.S. Cl. 222—108 23 Claims



1. A refrigerated fluid dispensing and agitating apparatus comprising:
A. a thermally insulated, open-ended enclosure structure incorporating:

1. interior sidewalls defining an open-ended space therebetween to the outside, and
2. a thermally conductive liner forming at least a portion of the interior sidewalls;

B. a fluid container interfitting within and removable from the space defined by the interior sidewalls of the enclosure structure, incorporating:
1. a thermally insulated front plate forming a thermally and mechanically sealed compartment with said enclosure structure, and
2. a handle portion connected to the front plate for facilitating removal of the container from the enclosure structure;

C. fluid dispensing means cooperating with the fluid container for removal of fluid therefrom;

D. refrigeration means cooperating with the thermally conductive liner for cooling the liner; and

E. a removably engageable fluid agitator incorporating:
1. a mixing blade rotatably mounted within the fluid container;
2. first means for supplying rotational energy to the mixing blade; and
3. second means for removably engaging the first means to the mixing blade; and

F. switching means connected to said refrigeration means, said switching means incorporating a fluid container sensor, whereby said refrigeration means are de-energized when the fluid container is removed from the enclosure structure;

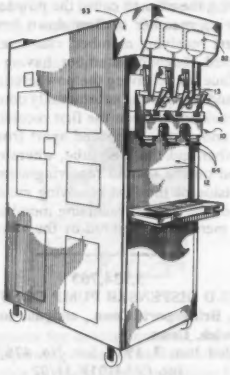
whereby the contents of the fluid container are refrigerated, dispensed, agitated, and stored when the fluid container is within the enclosure structure and dispensed when the fluid container is removed from the enclosure structure.

3,934,759

MULTIPLE DISPENSING HEAD FOR MILK SHAKE MACHINES

Frank Giannella, 3 Emeline Drive, Hawthorne, N.J. 07506, and Enzo Pellicciari, 140 Hepburn Road, Clifton, N.J. 07012

Filed Feb. 28, 1975, Ser. No. 554,263
Int. Cl.² B67D *5/56*
U.S. Cl. 222—129.1 **9 Claims**



1. A multiple head mixing, blending and dispensing apparatus for mixing and dispensing a variety of flavored comestibles such as milk shakes from a single machine having a reservoir of unflavored comestible and reservoirs of flavoring syrups, comprising:

a housing mounted on the front panel of a milk shake machine in communication with its reservoir of unflavored comestible and its reservoirs of flavoring syrups;

a plurality of mixing, blending and dispensing heads mounted within said housing, each of which is in communication with said reservoir of unflavored comestible and each of which is in communication with at least one reservoir of flavoring syrup; and each of which may be operated simultaneously with the others;

selection means to select the desired flavoring syrup to be mixed, blended and dispensed from each head;

a premix compartment within said housing communicating with said comestible and flavor reservoirs;

a comestible inlet port for admitting said unflavored comestible under pressure into said premix compartment;

at least one flavoring inlet port downstream from said comestible inlet port for admitting a flavoring under pressure into said comestible flow entering said premix compartment;

a blending compartment within said housing downstream from and communicating with said premix compartment;

a plurality of channels interconnecting said premix chamber to said blending compartment;

said premix compartment, in combination with said comestible and flavor pressurized flows and said channels, being disposed to produce a turbulent mixing of said flavoring and said comestible;

blender means rotably mounted within said blending compartment;

blender power means rotating said blender;

a dispensing nozzle attached to said housing downstream from and communicating with said blending compartment; and

manually operable control means for actuating said blender power means, for controlling the flow of said comestible, and for controlling the flow of said flavoring within said head;

a dispensing nozzle attached to said housing downstream from and communicating with said blending compartment; and

manually operable control means for controlling the flow of said comestible, and for controlling the flow of said flavoring within said head and for activating said blender power means.

3,934,760

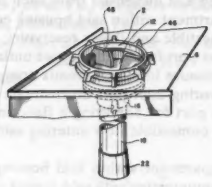
RETRACTABLE AND VENTED POURING SPOUT

Edsel Le Gresley, 170 Commander Blvd., Agincourt, Ontario, Canada

Filed Oct. 24, 1974, Ser. No. 517,792
Claims priority, application Canada, Jan. 22, 1974, 190653
Int. Cl.² B67D *3/00*
U.S. Cl. 222—153 **12 Claims**

1. A combined closure and pouring spout assembly comprising an outer closure member to be received within an opening provided in a container, the outer closure having an outwardly opening recess to receive a closure plug, an inner transverse wall in the outer closure defining a bottom for the recess and a circular aperture provided in the inner transverse wall and an elongate tube in the form of a pouring spout having inner and outer ends carried in the circular aperture, the spout having throughout a major portion of its length an outer diameter less than the diameter of the circular aperture whereby the spout may be moved, when the closure plug is removed, to an extended pouring position and to a retracted position, the spout being held captive within the circular aperture by an annular flange provided on the outer end of the spout and by an enlargement provided on the inner end of the spout with the annular flange and enlargement having outer diameters greater than the diameter of the circular aperture, and a venting arrangement provided in association with the spout to provide air ingress into the container during pouring, the spout fitting loosely within the circular aperture with the

closure plug in sealing position in the outer closure providing communication between the interior of the spout and the interior of the container the closure plug being threadedly received within the outer closure and having two annular



spaced apart ridges on the bottom surface thereof for reception between an annular ridge provided on the inner transverse wall of the outer closure to effect air-and-liquid-tight sealing between the closure plug and the outer closure.

3,934,761

OUTER CONTAINER ASSEMBLY FOR HOUSING AN AEROSOL

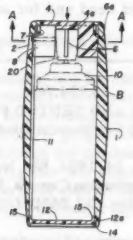
Guy Rene Gentreau, Vincennes, France, assignor to Les Parfums de Dana, Inc., New York, N.Y.

Filed July 25, 1974, Ser. No. 491,655

Claims priority, application France, Oct. 19, 1973, 73.37319

Int. Cl.² B65D *83/14*

U.S. Cl. 222—183 **9 Claims**



1. An outer container assembly for housing a spray container of the type having a depressable spray valve member at one end thereof and a laterally extending spray nozzle at said one end, said outer container assembly comprising a tubular body having internal dimensions of a size to receive a spray container to be housed therein, said tubular body having an open bottom of a size to permit the spray container to be passed therethrough, and an inwardly extending flange at its top end defining a top opening, an upper closure member within said tubular body, said upper closure member having a plurality of vanes extending to slidably engage the inner surface of said body to hold said upper closure member in said tubular body, said closure member having peripheral dimensions enabling its assembly in said body by way of said open bottom while inhibiting passage through said top opening, said body being free of internal portions which would inhibit passage of said upper closure member from said open bottom to said top opening, said vanes further defining a space for receiving the spray valve member of a spray container assembled within said tubular body, a spray outlet in said tubular body, said upper closure member further comprising means for holding the spray nozzle of a spray container assembled therein aligned with said outlet, and a bottom closure member for closing said open bottom for holding a spray container within said tubular body, said closure member having a plate-shaped member extending into said top opening, said vanes depending from said plate-shaped member and having stepped portions positioned to engage said flange to inhibit passing of said upper closure member through said top opening, the upper surface of said plate-shaped member being substantially flush with the outer surface of said tubular body at said flange.

3,934,762

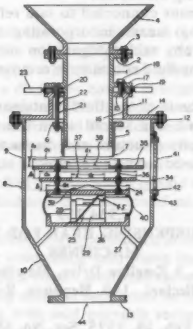
APPARATUS HAVING VIBRATING PLATES FOR FEEDING POWDERED MATERIAL

Kiyoshi Urayama, Kyoto, Japan, assignor to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Dec. 20, 1974, Ser. No. 535,117

Int. Cl.² B65G *65/70*

U.S. Cl. 222—200 **7 Claims**



1. An apparatus for feeding a powdered material comprising a first receiving member having a substantially horizontal receiving surface, a feed tube for feeding the powdered material onto the first receiving member, and means for vibrating the first receiving member to cause the powdered material on the first receiving member to flow down from a peripheral edge of the first receiving member, characterized in that at least one second receiving member having a substantially horizontal surface for receiving the powdered material fromm the feed tube and an opening substantially concentric with the feed tube is provided between the first receiving member and the feed tube and vertically spaced apart from both the first receiving member and the feed tube, whereby the powdered material placed on the second receiving member is made to flow down outside of the first receiving member from a peripheral edge of the second receiving member when the second receiving member is vibrated by the vibrating means.

3,934,763

HAND-HELD DISPENSER PUMP CONSTRUCTION

Wolf Steiman, Bridgeport, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed June 3, 1974, Ser. No. 476,039

Int. Cl.² G01F *11/02*

U.S. Cl. 222—321 **6 Claims**

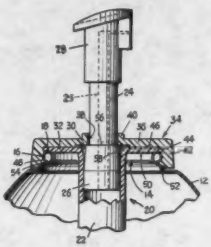
1. A hand-held dispenser pump construction comprising, in combination:

a. an aerosol-type can including a crowned top portion surrounding a top opening, said top portion having an outturned curl forming an annular rounded bead constituting the top rim of the can;

b. a plastic pump cylinder and protruding plunger carried thereby, said cylinder at its mouth having an integral, annular, outwardly extending mounting flange supported adjacent its periphery on the top rim of the can;

c. a one-piece, snap-on plastic closure member comprising an inverted, dish-shaped member having a flat disk-like body provided with a central opening through which the plunger extends and in which it is reciprocatable;

d. said closure member including an integral depending peripheral flange having an annular undercut closely adjacent the disk-like body for receiving and holding captive the mounting flange of the pump cylinder



whereby the upper side of said mounting flange is directly engaged by the underside of the disk-like body; and

e. said peripheral flange having in its inside wall a shallow annular groove of slightly less axial extent than said curl and immediately adjacent said annular undercut adapted to receive the outer wall portion of the outturned curl of the can when the closure is snapped over the top opening thereof; whereby

f. said top rim of the curl directly, sealingly engages the underside of the mounting flange of the pump cylinder adjacent its periphery to provide a leak-resistant seal without the use of any sealing gasket or washer.

3,934,764

APPARATUS FOR DOSING AND DISPENSING GRANULAR MATERIAL INTO CAPSULES

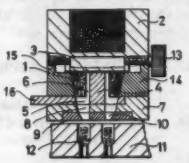
Manfred Rebmann, Hegnach, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 3, 1974, Ser. No. 485,502

Claims priority, application Germany, July 5, 1973, 2334185

Int. Cl.² G01F 11/28

U.S. Cl. 222—451 **12 Claims**



1. In an apparatus for dosing material, especially granular material, and dispensing doses of said material into capsules, including a housing having a supply container for the granular material and a plurality of dosing chambers for receiving said granular material formed therein, said dosing chambers each having inlet and outlet apertures, the improvement comprising:

first slide means mounted within said housing, said first slide means separating said supply container from said plurality of dosing chambers and controlling in its movement opening and closing of the inlet apertures of said dosing chambers; and

second slide means mounted within said housing, said second slide means including penetrations and recesses which adjoin said dosing chambers, said recesses being disposed laterally of the dosing chambers and their respective penetrations, said second slide means controlling in its movement opening and closing of the outlet apertures of said dosing chambers with said penetrations and increasing the effective volume of said dosing chambers with said recesses to aid in dispensing the material therefrom.

3,934,765

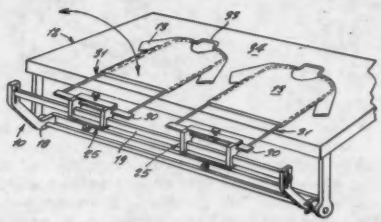
DEVICE FOR MASS PRODUCTION GARMENT STEAMING

Mihai Goldstein, 7239 Bergen Court, Brooklyn, N.Y. 11234

Filed Aug. 20, 1974, Ser. No. 499,001

Int. Cl.² A41H 5/00

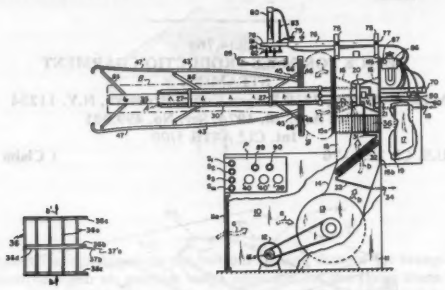
U.S. Cl. 223—70 **1 Claim**



1. In a device for garment steaming, the combination of a steam table having a top surface, a stationary horizontal shaft supported by stanchions in spaced relation below a forward edge of said table, a U-shaped frame pivotally mounted on said shaft, said U-shaped frame comprising a pair of parallel, spaced apart levers and a bar between one end thereof, an opening in each lever near said end, said openings being axially aligned and receiving said shaft, an elongated slot near an opposite end of each said lever, a clamp support bar between said slots being adjustably supported therein respective to said shaft, a plurality of clamps adjustably mounted along said clamp support bar, a flat garment supporting form being removably held by each said clamp, said garment supporting clamps in one pivotal position of said U-shaped frame resting flat against said steam table upper surface, and adjustable stop means for limiting a pivotal travel of said U-shaped frame for a selective upward position of said garment supporting form, said adjustable stop means comprises a projection on a side of each said lever, said projection being axially parallel to said shaft, and a pair of collars rotationally adjustably mounted on said shaft, each collar having a radially extending pin, said pin extending into a travel path of one of said projections; said clamp supporting bar and said bar which is between the one ends of said levers being parallel to said stationary shaft which is supported by said stanchions, said levers being at right angle to both said bars and said stationary shaft; each said clamp having a slot for receiving said clamp support bar, and also having a mouth for receiving said garment supporting form, a single thumb screw on each said clamp for securement of said clamp on said clamp supporting bar, another single thumb screw also on each said clamp for securement of one said garment supporting form on said clamp; said mouth being formed between a pair of jaws one of which has a spur at its end projecting into said mouth and in a direction toward the other said jaw for abutting against said garment supporting form positioned in an inner end of said mouth, certain of said clamps each comprising a pair of parallel, spaced bars each of which contains one said slot and one said mouth and said pair of bars being held together by a pair of interconnecting plates,

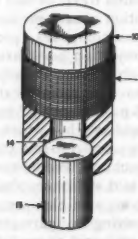
while others of said clamps each comprise a single block containing said slot and said mouth.

3,934,766
GARMENT FINISHER
Stanley M. Bailey, Hamburg, Pa., assignor to Garment Finishing Equipment Corporation, Cambridge, Mass.
Continuation-in-part of Ser. No. 508,885, Sept. 24, 1974, Pat. No. 3,883,051. This application Feb. 3, 1975, Ser. No. 546,213
Int. Cl.² D06C 15/00
U.S. Cl. 223—73 10 Claims



1. In a garment finishing machine having a support base, a set of longitudinally extending creasing blades operatively carried by said support base, means carried by said support base for supplying heated fluid along said blades, said means for supplying heated fluid comprising an air supply duct, an electric heater of plate-like construction positioned to extend across said duct and define a plurality of air flow passageways therethrough for heating the air, and thermal probe means for controlling a supply of electric energy to said heater to maintain the air being supplied by said duct at a desired heated temperature.

3,934,767
TEXTILE PACKAGE OF A CELLULAR PLASTIC CORE WITH WOUND YARN
Edward Jones, Clarkes Summit, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.
Filed Feb. 28, 1973, Ser. No. 336,651
Int. Cl.² B65H 81/00; B65D 85/676; B65H 75/14; B32B 5/18
U.S. Cl. 223—106 4 Claims



1. A textile package comprising a deformable, hollow, readily splitable cellular plastic core adapted for an interference fit on the spindle of a yarn takeup or yarn dispensing apparatus, and filaments, fibers or yarn wound on said core, said plastic core having a density of about 1.5 to 3 lbs. per cubic foot and a wall thickness of at least about one-fourth inch whereby compression of the inside of the core, causing an increase of one-sixteenth inch in the inside diameter of the core, will not change the outside diameter of the core and compression of the outside of the core by shrinkage of the filaments, fibers or yarns thereon will not decrease the inside diameter of the core.

3,934,768
GUN SUPPORT
Max E. Jones, 42398 Barbary St., Fremont, Calif. 94538
Filed Mar. 11, 1974, Ser. No. 449,975
Int. Cl.² F41C 33/00
U.S. Cl. 224—1 R 3 Claims

1. In a gun support including a support member formed with a passageway therein dimensioned for mounting of said support member to a belt-like garment proximate the front waist of the user, said support member further being formed with a pocket having an open top dimensioned to receive the trigger guard of a gun therein, said open top being accessible for receipt of said trigger guard from a front side of said member, the improvement comprising:

an elastomeric member removably mounted in said pocket whereby a plurality of elastomeric members of similar external form may be interchangeably mounted in said pocket;

said elastomeric member having an interior wall defining an open top cavity mounted in registration with said open top of said pocket, said interior wall of said cavity being custom formed and contoured to mate with and provide a substantially continuous support for and resilient gripping of the outer periphery of the trigger guard of a particular gun whereby a plurality of elastomeric members may be interchangeably mounted in said pocket for support of any one of a plurality of guns; and

said elastomeric member being formed to resiliently grip and support said trigger guard with sufficient force to provide substantially the sole support required for said gun to secure the same in an upright ready for use position proximate the front waist of the user.

3,934,769
SHOULDER CARRIER FOR VIDEO TAPE MACHINE AND CAMERA
David Carlson, Jr., 3140 NE. Bryce, Portland, Oreg. 97212
Filed June 17, 1974, Ser. No. 479,600
Int. Cl.² A45F 5/00
U.S. Cl. 224—5 V 5 Claims

1. A shoulder carrier for a portable camera and associated videotape machine, comprising

a. a body portion having front, rear and side portions,

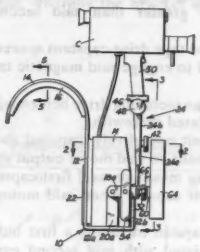
b. a pair of rearwardly extending hooks on said body portion arranged for engagement frontwise over the shoulders of a cameraman for supporting said body portion in front of a cameraman above the waist,

c. means in said body portion defining a pocket arranged to removably receive and hold a video tape machine,

d. an upright standard secured at its lower end to the front of said body portion and projecting above said pocket,

e. means at the upper end of said standard to support a

camera thereon which is electrically connected to the video tape machine,



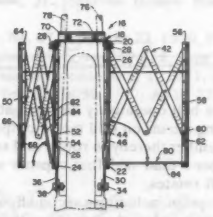
f. and bracket means on said body portion exteriorly of said pocket for holding accessory equipment.

3,934,770

COLLAPSIBLE BICYCLE ARTICLE CARRIER

Elizabeth Larsen, 137 Bluefield Ave., Newbury Park, Calif. 91320

Filed Aug. 30, 1974, Ser. No. 502,061
Int. Cl.² B62J 9/00
U.S. Cl. 224—33 2 Claims



1. A collapsible bicycle article carrier comprising:

a fixed frame;

said frame being substantially U-shaped in configuration with said frame having a pair of substantially parallel, spaced apart legs, said frame adaptable to be placed over the rear wheel of a bicycle with one of said legs located on either side of the bicycle wheel and the apex portion of the frame forming an additional seat for the bicycle

a carrying unit attached to each said leg, each carrying unit formed of the following elements:

a scissor-linkage assembly attached to said frame, said scissor-linkage assembly comprising a plurality of pivotally connected links, two in number of said links being pivotally connected to said frame forming a first pair of separate connection points, one of said connection points of said first pair being slidably movable with respect to said frame between a first position and a second position;

an outer wall connected to the free end of said scissor-linkage assembly, two in number of said links being pivotally connected to said outer wall forming a second pair of separate connection points, one of said connection points of said second pair being slidably movable with respect to said outer wall, said outer wall movable by said scissor-linkage assembly between a closed position and an open position, said closed position being when said outer wall is located directly adjacent said frame with said movable connection point of said first pair in said first position, said open position being when said outer wall is spaced from said frame with said movable connection point of said first pair in said second position; and

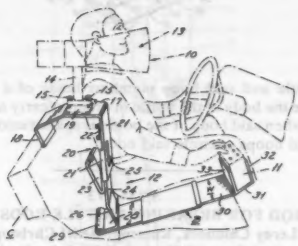
a bottom connected between said outer wall and said frame when said outer wall is in said open position, said bottom pivotally connected to said frame, said bottom positioned against said frame when said outer wall is in said closed position.

3,934,771

RADAR MOUNT AND HOLDING BRACKET

Frank A. Eberhard, 418 N. Birney St., Bay City, Mich. 48706

Filed Mar. 5, 1974, Ser. No. 448,402
Int. Cl.² B60R 7/04
U.S. Cl. 224—42.42 A 17 Claims



1. A bracket for readily and releasably mounting components of a mobile radar scope set in a vehicle interior, said bracket comprising an upright panel part having plural means for the mounting, in its entirety and within the vehicle interior, of one component of said scope set, and also for the mounting, also entirely within the vehicle interior but out of physical engagement with an in substantially spaced relation to said one component, of another component of said scope set, in which said upright panel part has a lateral extension on which a radar cone is supported as said one component of said scope set, and has a further lateral extension spaced vertically from the first-named extension, on which further extension a control unit is mounted as said other component of said scope set, said lateral cone-supporting extension being horizontal and spaced vertically above said further extension, said upright panel part and first-named extension including means to frictionally and releasably engage an upright back cushion member of the vehicle interior, with said first-named extension resting atop said member and said further extension horizontally located in position to rest on a seat cushion member of the vehicle interior.

3,934,772

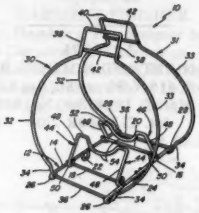
DEVICE FOR LIFTING, CARRYING AND INVERTING WATER COOLER BOTTLES

Jerome A. Brannan, St. Cloud, Minn., assignor to Dansen Company, Inc., Waite Park, Minn.

Filed Aug. 30, 1974, Ser. No. 502,176
Int. Cl.² B65D 87/00
U.S. Cl. 224—45 AA 10 Claims

1. A device for lifting, carrying and inverting water cooler bottles comprising a generally open rectangular frame means, a pair of jaw members each pivotally connected at one end to spaced portions of said frame means and each jaw member having means at its other end for gripping the neck of a water cooler bottle when said jaw members are pivoted into an angular relationship to one side of said frame means with their said other ends nearer each other than the distance between their said one ends so that the neck gripping means of said jaw members can engage the neck of said water cooler bottle when said neck is extending upwardly through said frame means in order to lift said bottle, and a pair of hoop members pivotally connected to portions of the frame means spaced at least as far apart as said one ends of said jaw members so that said hoop members can be pivoted in a direction to said one

side of said frame means for lifting said bottle when said neck gripping means of said jaw members are engaging said bottle neck, said frame means having a width less than the body of



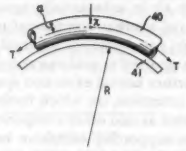
the bottle and said hoop members being of a size so as to encircle the body of the bottle in order to carry and invert said bottle when said body of the bottle is against said frame means and said hoops encircle said body.

3,934,773

METHOD FOR BREAKING BRITTLE RODS OR FIBERS

Edwin Leroy Chinnock, Rumson; Detlef Christoph Gloge, Red Bank, and Peter William Smith, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 2, 1973, Ser. No. 412,293
Int. Cl.² B26F 3/00
U.S. Cl. 225—2 2 Claims



1. The method of breaking a brittle material including the steps of:

scoring said material over a region along its surface;

mounting said material on a flexible bending form with said scored region facing away from said form;

and bending said form and said material while simultaneously applying to said form and said material a nonuniform tensile stress which decreases from a maximum value at said region to a minimum value along the opposite surface in contact with said form and which, at all points therebetween, is less than the threshold stress for producing a mist zone fracture, said minimum value being grater than zero by a sufficient amount to insure a mirror-type fracture.

3,934,774

DUAL SPEED TAPE DRIVE SYSTEM FOR AN ENDLESS LOOP DICTATING AND TRANSCRIBING SYSTEM

James C. Whitney, Fairfield, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,856
Int. Cl.² B65H 17/20
U.S. Cl. 226—50 6 Claims

1. A bidirectional tape drive assembly including provision for dual speed tape drive in one direction for a dictating and transcribing system utilizing an endless loop of magnetic tape of substantial length comprising:

a motor including an output shaft,

said output shaft having first and second drive belt engaging means thereon,

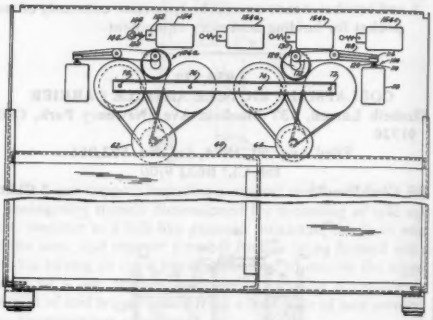
said first belt engaging means having an effective diameter significantly greater than said second belt engaging means,

first and second tape drive capstans spaced from each other and adapted to engage said magnetic tape and drive said tape,

said first capstan including drive belt engaging means operatively associated therewith,

a first drive belt operatively disposed about said first belt engaging means on said motor output shaft and said drive belt engaging means on said first capstan thereby to rotate said first capstan when said motor output shaft rotates,

said second capstan including a first hub member operatively associated with said second capstan through an overriding clutch means,



a second drive belt operatively disposed about said second belt engaging means on said motor output shaft and said first hub member thereby to rotate said second capstan at a slower speed than said first capstan when said motor output shaft rotates,

said second capstan including a second hub member spaced from said first hub and overriding clutch member and keyed to said second capstan, and

an idler wheel member disposed between said second hub member on said second capstan and said drive belt engaging means on said first capstan and movable from a first position spaced from said second hub member and said first capstan drive belt engaging means and a second position in frictional contact with said second hub member and said first capstan drive belt engaging means thereby to impart the faster speed of rotation of said first capstan to said second capstan.

3,934,775

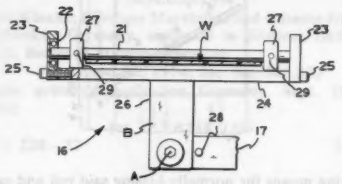
WEB CENTERING DEVICE

William B. Keller, Bayside, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 15, 1974, Ser. No. 514,477
Int. Cl.² B65H 23/04
U.S. Cl. 226—196 3 Claims

1. A self-centering device for centering a moving web of thin sheetlike material along its intended path of travel, said device comprising in combination: a roller extending transversely across the path of travel of the web; a bracket rotatingly supporting said roller in rotating contact with one surface of the web, said bracket being pivotally mounted on an axis which extends parallel to the path of travel of the web and which is spaced from the moving web, closer to the surface of the web which is not contacted by the roller than to the surface which is contacted by the roller; and a pair of raised guides attached to the roller at spaced apart locations adjacent the opposed edges of the web when the web is moving along

its intended path of travel, each of said guides being positioned to contact the adjacent of the edges of the web when the web drifts from its intended path of travel of said web toward said guide, whereby the bracket and the roller pivot



about said axis in a plane extending transversely of the path of travel of the web thereby establishing an imbalanced force load on the web which will tend to draw the web back to its intended path of travel.

3,934,776

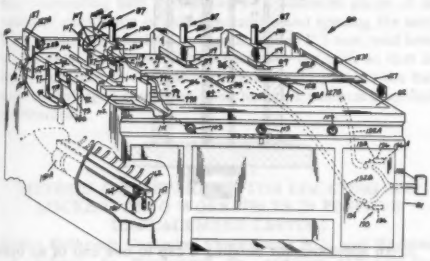
APPARATUS FOR FORMING PIPED OPENINGS IN A GARMENT

John L. Cruden, Jr., Marvin Hollow Road, Walton, N.Y. 13856

Division of Ser. No. 47,950, June 22, 1970, Pat. No. 3,654,635, which is a division of Ser. No. 739,812, June 25, 1968, Pat. No. 3,587,501. This application Oct. 1, 1971, Ser. No. 185,562

Int. Cl. D05b *3/00*; **A41d** *27/20*

U.S. Cl. 227—76 **23 Claims**



1. An apparatus for locating and forming an opening in the facing of a piece of material adapted to overlie an opening formed in the front of said material to form a finished opening comprising:

means defining a support for the front and facing portions of said material,

means for locating the position of the opening to be formed in said facing with respect to a fold line between said facing and front portions,

forming means for forming the opening in the facing material to correspond with the opening in said front portion,

and actuating means operatively coupling said locating means with said forming means whereby the positioning of the locating means with respect to the opening in said front portion effects the location of the forming means over said facing with respect to said fold line a corresponding amount.

3,934,777

MACHINE FOR THE ATTACHMENT OF FASTENERS

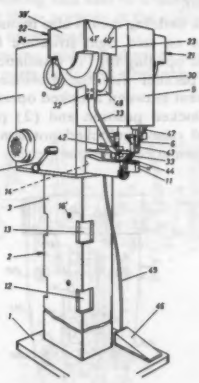
Friedhelm Kramer, Ennepetal-Milspe, and Gunter Wolfertz, Wuppertal, both of Germany, assignors to Firma Schaeffer-Homberg GmbH, Wuppertal-Barmen, Germany

Filed Aug. 15, 1974, Ser. No. 497,643

Claims priority, application Germany, Aug. 16, 1973, 7329772

Int. Cl.² B21J *15/10*

U.S. Cl. 227—109 **3 Claims**



1. In a machine for the attachment of fasteners comprising a machine head, an upper tool and a lower tool mounted on said head for applying upper and lower fastener parts to an article, said head having a pair of lateral flanks, and drive means in said rotatable head, for feeding fastener parts to said tools, the improvement which comprises:

a pair of housings each including therein a tumbler drum rotatable to dispense respective fastener parts, each of said housings having a pair of opposite sides;

hanger means on each of said flanks of said head for engagement with either of said sides of a respective one of said housings for supporting said housings interchangeably on said flanks of said head;

a drive element extending from each of said sides of each housing for coupling to said drive means upon hanging of each housing on a respective flank of said head; and

a respective supply rail extending from each of said housings to a respective one of said tools for delivering the respective fastener parts thereto, said supply rail each being detachably secured to the respective housing and removable therewith from said head.

3,934,778

STAPLE DRIVING DEVICE WITH IMPROVED STAPLE JAM CLEARING MECHANISM

Robert E. Males, Cranston, R.I., assignor to Textron, Inc., Providence, R.I.

Filed Feb. 13, 1975, Ser. No. 549,747

Int. Cl.² B25C *5/06*

U.S. Cl. 227—123 **9 Claims**

1. A staple driving device comprising

means defining a staple drive track,

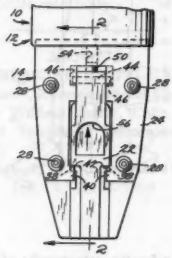
a staple driving element slidably mounted in said drive track for downward movement through a staple driving stroke and upward movement through a return stroke,

said drive track defining means including a rigid structure having opposed flat side surfaces defining the sides of said drive track for guidingly engaging the legs of a leading staple during the driving movement thereof, a forwardly

facing flat surface extending between said side surfaces for guidingly engaging the rear surface of a leading staple during the driving movement thereof, and longitudinally extending surfaces defining an opening of a staple-shaped configuration extending fowardly into communication with said drive track defining surfaces,

staple magazine means for receiving a stick of staples and feeding successive leading staples forwardly into said drive track through said staple-shaped opening to be driven outwardly of said drive track into a workpiece by said staple driving element during the staple driving stroke thereof,

said drive track defining means also including a rigid member mounted on said rigid structure forwardly of said staple-shaped opening for (1) translational movement in a direction parallel with the movement of said staple driving element between a locked operating position and a raised unlocked position and (2) pivotal movement between said raised unlocked position and a forwardly extending open access position,



said rigid member having (1) staple stop surface means facing rearwardly when said rigid member is in said locked operative position for engaging the forward surface of a leading staple after the feeding movement thereof through said staple-shaped opening by said magazine means, (2) staple guiding surface means facing rearwardly when said rigid member is in said locked operative position for guidingly engaging the forward surface of a leading staple during the driving movement thereof by said staple driving element, and (3) cam surface means extending downwardly and forwardly from the upper end of said staple stop surface means when said rigid member is in said locked operative position operable (1) when said rigid member is pivoted from said unlocked position into said open access position to permit limited forward movement of a leading staple fed through said opening, and (2) when said rigid member is pivoted from said open access position to move a leading staple rearwardly into a position of alignment with said drive track.

3,934,779

FASTENER DRIVING TOOL

Gilbert Dent, 103-01 118th St., Richmond Hill, N.Y. 11419

Filed Oct. 31, 1974, Ser. No. 519,670

Int. Cl.² B25C 1/04

U.S. Cl. 227—147 **7 Claims**

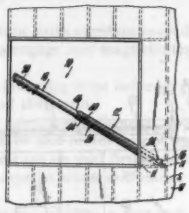
1. A fastener driving tool for use at otherwise inaccesible locations, said fastener driving tool comprising:

a. a cylinder having a first open end and a second end;

b. an elongated ram slidably mounted in said first open end of said cylinder, said ram including a first end positioned outwardly of said first end of said cylinder and a second end adjacent said second end of said cylinder;

c. a clip for releasably holding the head of a fastener proximate said second end of said cylinder;

d. an elongated, axially displaceable rod mounted on and positioned substantially parallel to the longitudinal axis of said cylinder, said rod having a first end positioned proximate said first end of said cylinder and a second end coupled to said clip; and



e. spring means for normally biasing said rod and said clip to a fastener holding position.

3,934,780

APPARATUS FOR MAKING TUBULAR CONTAINERS

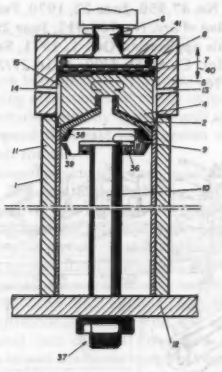
Valere Flax, Fezensac, France, assignor to Metal Box Limited, Reading, England

Division of Ser. No. 383,597, July 30, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,555

Claims priority, application France, Aug. 3, 1972, 72.28664

Int. Cl.² B23K 19/02

U.S. Cl. 228—2 **10 Claims**



1. An apparatus for bonding a cap to one end of an open ended tubular body along a joining seam adjacent one end of said tubular body by applying heat to said seam, comprising first means for holding said tubular body, said first holding means having a longitudinal axis, second means for holding said cap in axial alignment with said first holding means relative to said longitudinal axis, means for axially moving said first and second holding means axially relative to each other, pressure menas for pressing said holding means axially relative to each other to bring the cap into frictional contact with said tubular body along said seam, drive means operatively connected to at least one of said holding means for positively rotating one of said holding means relative to the other to produce sufficient bonding heat by friction between the cap and the tubular body, wherein said second holding means comprise an outer holding member and an inner holding member, a housing, means for rotatably and axially movably supporting said outer holding member in said housing, and means for rotatably supporting said inner holding member inside said tubular body in axial alignment with said outer holding member to receive said cap between the inner and

outer holding members, and wherein said pressure means are located between said outer holding member and said housing for pressing the outer holding member and thus the cap against the inner holding member.

3,934,781

SOLDERING BATH FOR FLUXLESS ULTRASONIC SOLDERING

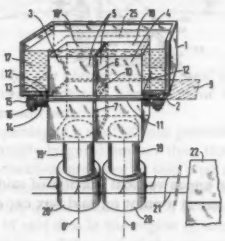
Günter Klauke; Rüediger Marziniak, and Günter Güerke, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 12, 1974, Ser. No. 505,333

Claims priority, application Germany, Sept. 18, 1973, 2346993

Int. Cl.² B23K 1/08

U.S. Cl. 228—37 **10 Claims**



1. A solder bath for fluxless ultrasonic soldering comprising a vessel for holding molten solder and having a base, at least two sonotrodes, an acoustic head associated with each of said sonotrodes, a common oscillatory circuit for said acoustic heads so that each of the sonotrodes has at least one node of oscillation, a web having a width of at most 0.3 mm, said web interconnecting said sonotrodes at a common plane of the nodes of oscillation of said sonotrodes and spacing the sonotrodes apart by a distance no greater than 0.3 mm, said sonotrodes extending through said base into the bath so that the sonotrodes are in co-phasial operation and provide the bath with an enlarged cavitation zone having a uniform amplitude distribution.

3,934,782

METHOD AND APPARATUS FOR LOCATING AND LOCKING ONTO WORKPIECES IN POSITIVE DISPLACEMENT CASTING

Robert Holbrook Cushman, Shrewsbury, N.J., and Raymond L. Schenk, Jr., Doylestown, Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 435,169, Jan. 21, 1974, abandoned. This application Mar. 12, 1975, Ser. No. 557,537

Int. Cl.² B23K 3/02; B22D 19/04

U.S. Cl. 228—51 **3 Claims**

1. Apparatus for bonding *n* (where *n* is equal to two or more) meltable component parts together by a positive displacement molecular fusion bonding process, said apparatus comprising, in combination:

a. means for supporting said *n* meltable component parts on an upstanding vertically oriented work axis, at least one of said components having an annular locating collar coaxial with said work axis;

b. a frame;

c. a bonding head carried by said frame in a position overlying the component parts;

d. a barrel carried by said bonding head for movement along said work axis into sealing engagement with the component parts to be bonded;

e. a ram carried by said bonding head for movement along said work axis, said ram being coaxial with said barrel and capable of axial movement therethrough;

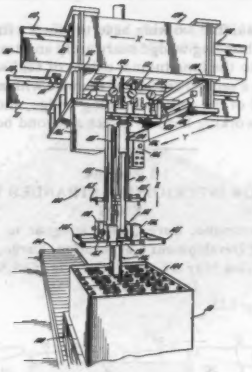
f. means for moving said head to a position where said ram and barrel are coaxial with said work axis;

g. means for advancing said barrel and said ram into engagement with said component parts and with said locating collar extending upwardly into said barrel;

h. means for locking said bonding head in position when said locating collar is properly positioned within the lower end of said barrel;

i. means for heating said ram to a temperature sufficiently high to melt those portions of the component parts in the path of ram movement;

j. means advancing said ram through said barrel and said component parts along said work axis as said heated ram



melts the portions of said component parts in the path of ram movement, whereby the molten material formed is displaced by said ram into said barrel and stored therein in heat transfer relation with said ram and a cavity is formed in said component parts;

k. means for axially retracting said ram from said component parts so as to enable the displaced molten material stored in said barrel to flow back to said cavity where said material is permitted to cool and solidify to form a uniform molecular fusion bond between said component parts with said bond being coextensive with the degree of penetration of said ram into said component parts;

l. means for axially retracting said barrel from engagement with said component parts following cooling and solidification of said molten material; and,

m. means for releasing said head locking means upon axial retraction of said barrel.

3,934,783

MULTIFACE WIRE BONDING METHOD AND TOOL

John E. Larrison, 2949 Baker St., Costa Mesa, Calif. 92626

Filed Sept. 30, 1974, Ser. No. 510,416

Int. Cl.² B23K 1/06

U.S. Cl. 228—110 **39 Claims**

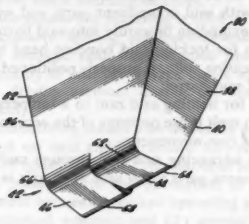
1. Wire bonding apparatus comprising

a bonding wedge having first and second wire contact areas of mutually different orientation, a wire guide having a feed end adjacent said contact areas, and

means for movably mounting said guide with respect to said wedge for motion between first and second positions at which a wire extending along said guide and from said feed end is in registry with said first and second contact areas, respectively, and one at a time.

25. The method of ultrasonically bonding a wire to two spaced points of a workpiece comprising the steps of

contacting a first section of the wire with a first working head of a bonding wedge,



vibrating said first working head to effect a first bond, shifting said bonding wedge rearwardly and transversely with respect to the longitudinal extent of said wire,

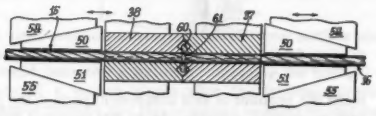
contacting a second section of the wire with a second working head of the shifted bonding wedge, and vibrating the second working head to effect a second bond.

3,934,784

METHOD FOR INTERJOINING STRANDED WIRE CABLE ENDS

Alfred H. Tessmann, Largo, Fla., assignor to Industrial Research and Development Corporation, Largo, Fla.

Filed May 27, 1975, Ser. No. 580,565
Int. Cl.² H01R 43/02
U.S. Cl. 228—125 9 Claims



1. A method of interjoining the ends of multiple strand wire cables comprising the steps of: metallurgically bonding a solid section of like metal coaxially to and between opposing end portions of the cables, and upsetting and removing a substantial portion of said section to effect a solid metal joint between said end portions having substantially the circumferential configuration of the cables.

3,934,785

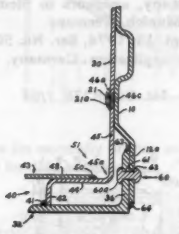
METHOD OF ASSEMBLING BOXCAR END STRUCTURE

Lowell L. Maio, St. Peters, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 421,462, Dec. 3, 1973, Pat. No. 3,866,546.
This application Aug. 26, 1974, Ser. No. 500,787
Int. Cl.² B23K 31/00
U.S. Cl. 228—135 6 Claims

1. A method of assembling a box car end structure comprising the following steps in the sequence indicated:

1. providing a box car end having an offset on one side thereof;
2. welding thereto a flat end liner on the side of said end opposite to said offset;
3. providing longitudinal relative movement between the welded end and end liner assembly and a box car end sill having a horizontal portion and a vertical extension such that the offset portion of said end engages said vertical extension;
4. integrally affixing said offset portion to said vertical extension with mechanical fasteners having a head thickness less than the extent of said offset;
5. welding to the horizontal portion of said end sill a floor support member having a horizontal portion adapted to support a floor panel and having an upper vertical portion adapted to provide a smooth and unobstructed end portion of the box car, and



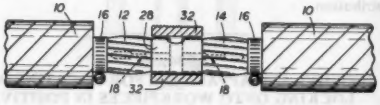
6. welding the upper vertical portion of said floor support to said box car at a point on said box car end above said offset.

3,934,786

METHOD AND APPARATUS FOR SPLICING AND WELDING STRANDED ELECTRICAL CABLES

Stephen Kozak, Upper Saddle River, N.J.; Frederick J. Bender, Huntington, and Jack Jerome, Glen Cove, both of N.Y., assignors to Jerome Underground Transmission Equipment, Inc., Commack, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,408
Int. Cl.² B23K 31/00
U.S. Cl. 228—138 25 Claims



1. In an apparatus for splicing and welding together the adjacent ends of stranded electrical cables,

a sleeve compressibly engaging the adjacent cable ends in alignment with each other and having a welding window defined therein,

deformable clamp means to compressibly and clampingly engage with each cable to effect a compaction of and eliminate interstices between the strands of the cable thereat and block the flow of fluid therebeyond and spaced from said sleeve to form on its respective cable an area of enlargement between said clamp means and said sleeve means,

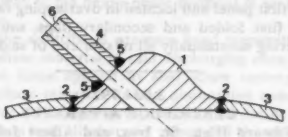
and a welding fixture connected about the cables adjacent said ends thereof and including means to effect a negative pressure at said enlarged area of each cable such that molten welding material deposited in said window experiences a migration substantially along the cable axis toward said enlarged area as the weld fills the window and connects said cable ends.

3,934,787

METHOD OF MOUNTING PIPE FLANGES IN THE WALL OF A PRESSURE VESSEL

Emil Fels, Pratteln, Switzerland, assignor to Buss, A.G., Basel, Switzerland

Continuation-in-part of Ser. No. 317,163, Dec. 21, 1972, abandoned. This application June 17, 1974, Ser. No. 480,100
Claims priority, application Switzerland, Dec. 18, 1971, 019005/71
Int. Cl.² B23K 31/02; F16L 13/04
U.S. Cl. 228—184 1 Claim



1. A method for the connection of a steel pipe to a pressure vessel of uniform thickness composed of high quality low carbon steel, comprising:

cutting an opening in a wall of said pressure vessel which is of substantially larger diameter than that of the pipe;

joining a connection member to said pipe and to said opening which consists of a forged bored disc of lenticular shape having a thickened central portion and a rim, the thickness of said disc in the region of said rim being equal to the thickness of the wall of the pressure vessel, and the thickness of said disc in the region of its bore being several times the thickness of the rim;

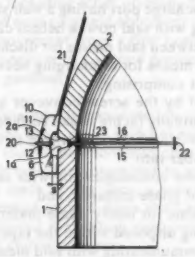
said joining being by a first welding step of said pipe to said connection member in the region of said bore, whereby the first weld at the edge of said bore merges into the lenticular form at the thickened central portion adjacent the bore connection to provide better impact strength at the first weld, and by a second welding step in smooth transition between the disc and vessel, in which there is provided a smooth transition between the material of the pipe wall, material of the disc, and of the vessel's wall.

3,934,788

METHOD FOR WELDING A TOP PART AND AN ASSOCIATED BOTTOM PART

Herbert Ammann, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 17, 1974, Ser. No. 434,066
Claims priority, application Switzerland, Jan. 18, 1973, 674/73
Int. Cl.² B23K 37/04
U.S. Cl. 228—212 4 Claims



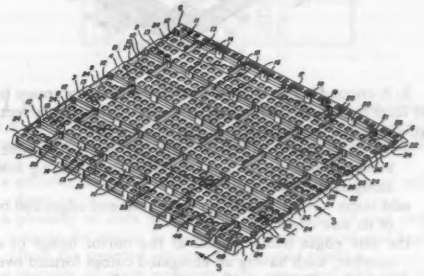
1. Method for welding a top part and an associated bottom part, spacers being employed to form a gap between both parts for filling with weld material whereupon the gap is filled with weld material, characterized in that both parts are provided with a plurality of corresponding claws, that the top part is located relative to the bottom part in a position which is such that the claws are oppositely disposed and that a resilient element which deforms when the weld material shrinks is provided between the claws of each claw pair, said resilient element comprising a spacer of a material which is more ductile than that of the claws and has a thickness which is such that the gap for filling with weld material has the required height after the claws of the top part are placed upon the claws of the bottom part and the dimensions of the claw support surfaces are such that the spacer is deformed when the weld seams shrink but without any excessive stresses occurring in the said weld seam.

3,934,789

MEAT SPACER TRAY

Richard L. Allman, Seymour, Ind., and Vernon E. Meurer, Fullerton, Calif., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 19, 1974, Ser. No. 534,569
Int. Cl.² B65D 1/00
U.S. Cl. 229—2.5 8 Claims



1. A meat spacer tray comprising:

A. a plurality of top rectangular planar members, said members having their longer sides extending longitudinally and having said members' top and bottom rectangular planar surfaces co-planar to one another respectively, wherein the top and bottom surfaces of one said member are coplanar to the corresponding surfaces of other said members,

B. a plurality of bottom rectangular planar members, said members having their longer sides extending longitudinally and having each of said members' top and bottom rectangular planar surfaces coplanar to one another respectively, wherein the top and bottom surfaces of one said member are coplanar to the corresponding surfaces of other said members, and said bottom members are positionally related to the top planar rectangular members in two ways: the first said way is by two distances, one being a vertical distance in a direction normal to said members top planar surfaces giving rise to a space between the bottom surfaces of said top planar members and the top surfaces of said bottom planar members and the other being a horizontal distance in a direction normal to said top members' longer side and the second said way is an alternation of top and bottom rectangular members wherein all top planar members have two nearest neighbors of bottom rectangular planar members and vice versa, except for the two planar recentgular members on the longitudinal outside edges,

C. a plurality of connecting means extending between bottom planar members and top planar members to secure the relative position of each top planar member with respect to each bottom planar member positionally adjacent to said top planar member,

D. a plurality of holes of at least two types; at least one said type extending between the top and bottom surfaces of top planar rectangular members, and the other said type

extending between the top and bottom surfaces of bottom planar rectangular members,

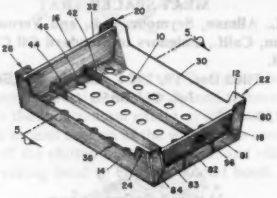
E. a plurality of holes, wherein the sides of said holes are the sides of two connecting means, the top surfaces of bottom planar members, and the bottom surfaces of the top planar members.

3,934,790

FARM PRODUCE CONTAINERS

Avard Joseph Easter, 1151 S. Walnut, La Habra, Calif. 90631

Filed May 24, 1974, Ser. No. 473,150
Int. Cl.² B65D 5/24, 5/48
U.S. Cl. 229—23 R 14 Claims



1. A creased blank suitable for folding along its crease lines to form the longer side walls and the bottom wall of a rectangular container, said blank comprising;

a flat rectangularly shaped board of material capable of being creased to form crease lines and of being folded along said crease lines;

said blank having portions of both of its end edges and both of its side edges cut away;

the side edges being shaped as the mirror image of one another, each having an elongated cutout formed over a majority of the central region thereof;

said end edges being shaped symetrically about the midpoint along their length and shaped as the mirror image of one another; and

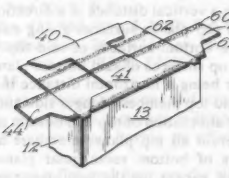
said end edges being formed with four cutouts arranged in series along said edges, the outer most two of said cutouts being V-shaped.

3,934,791

CARTON SEALING

Raymond S. Dick, Minneapolis, Minn., and David H. Anenson, River Falls, Wis., assignors to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Nov. 13, 1974, Ser. No. 523,217
Int. Cl.² B65D 5/02
U.S. Cl. 229—37 R 5 Claims



1. A carton closure for an end of a carton made from foldable paperboard or the like having four, rectangularly arranged side panels, comprising:

a first folded flap substantially covering said end of said carton hingedly attached to a first of said side panels along a hinge line;

a pair of opposed secondary flaps hingedly connected to the side panels at right angles to said first panel, said secondary flaps positioned in overlapping relationship to said first folded flap;

a first continuous band of adhesive extending across the length of said first folded flap along said hinge line, said first adhesive band located between said first flap and said secondary flaps;

a second line of adhesive extending across the length of said first folded flap juxtaposed along the edge of said flap furthest from said hinge line, said second band of adhesive located between said first flap and said secondary flaps; and

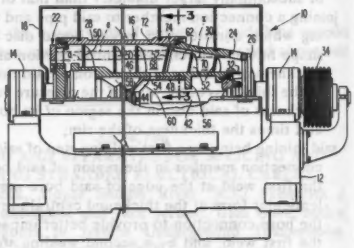
a fourth flap hingedly attached to the side panel opposite said first panel and located in overlapping relationship to said first folded and secondary flaps, said fourth flap covering substantially all of said end of said carton.

3,934,792

CENTRIFUGE APPARATUS

Robert Edward High, St. Ives, and Albert John Samways, Winston Hills, both of Australia, assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 3, 1975, Ser. No. 538,492
Int. Cl.² B04B 3/04
U.S. Cl. 233—7 15 Claims



1. In a decanter centrifuge for separating light and heavy phase materials into respective inner and outer layers from a mixture thereof and for separately discharging said materials, having an elongated imperforate bowl with a tapered portion, said bowl being adapted for rotation about its longitudinal axis, feed means for delivering the mixture to be separated into said bowl, a screw conveyor comprising a hub and a series of helical flights mounted on said hub, said series of helical flights being coaxially arranged within the bowl to advance heavy phase material in the direction of the tapered portion of the bowl during rotation of said screw conveyor relative to said bowl, means for discharging light phase material from the bowl, and means for discharging heavy phase material from the bowl including a discharge port in the tapered portion of said bowl, said discharge port having a weir surface, said screw conveyor defining with said bowl a helical chamber extending about said axis between said means for discharging light phase material and said means for discharging heavy phase material, that improvement comprising:

a baffle carried by the screw conveyor and extending between the mutually facing broad surfaces of two adjacent helical flights in sealing relationship to thereby divide the helical chamber into

a separating zone communicating with said means for discharging light phase material, and

a discharging zone for heavy phase material, said discharging zone being disposed within the tapered portion of the bowl and communicating with said means for discharging heavy phase material,

said baffle having an outer edge closely spaced from said bowl to define therewith a restricted passageway for the underflow of heavy phase material from the separating zone to the discharging zone and extending inwardly from said outer edge for at least the radial distance of the

combined thickness of said layers of light phase material and heavy phase material in the separating zone to prevent the flow of light phase material from said separating zone to said discharging zone,

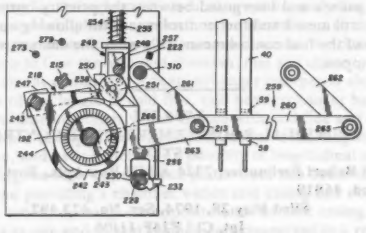
and means cooperating with said baffle to maintain the inner surface of the layer of separated light phase material at a level disposed inwardly of said weir surface and to discharge light phase material from said separating zone to said discharge passageway, the centrifugal pressure head of the layer of separated light phase material being applied to the heavy phase material in the separating zone and being transmitted through the restricted passageway to the heavy phase material in said discharging zone,

whereby the centrifugal pressure head transmitted to the heavy phase material in said discharging zone combines with the force applied by said screw conveyor to the heavy phase material in said discharging zone to overcome the centrifugal pressure head of the heavy phase material in said discharging zone, and thereby advance the heavy phase material in said discharging zone to said discharge port for discharge therefrom.

3,934,793
VOTING MACHINE

Cothburn M. O'Neal, Dallas; Alfred M. Mayo, Richardson, both of Tex.; George William Childs, deceased, late of Dallas, Tex., and by Patricia M. Childs, executrix, Dallas, Tex., assignors to Accuvote, International, Inc., Dallas, Tex.

Division of Ser. No. 309,174, Nov. 24, 1972, Pat. No. 3,866,826. This application May 28, 1974, Ser. No. 473,925
Int. Cl.² G07C *13/00*
U.S. Cl. 235—51 **23 Claims**



1. A voting machine comprising:

a columnar frame;

a plurality of voting keys arranged in said frame moveable between a first position and a second position, said keys carrying abutment means thereon;

linkage means including a bar pivotally connected at opposite ends and engaging said abutment means and adapted for planar movement from a first position with said keys in said first position to a second position with said keys in said second position;

a drive shaft;

clutch means operatively connected by crank means to said linkage means for moving said linkage means from said first to said second position, said clutch means including a first clutch member connected to said drive shaft and having gear teeth at one face, a seocnd clutch member slidably mounted on said drive shaft and having teeth on one face adapted for mating engagement with the teeth on said first clutch member;

a yoke shaft;

yoke shaft cam means adapted to position said yoke shaft;

yoke means carried on said yoke shaft and engaging said second clutch member; and

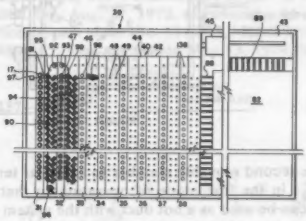
connector means for securing said yoke means to said yoke shaft with said linkage means in said first position,

whereby said yoke means may be selectively secured to said yoke shaft and cammed by said cam means to engage said clutch members thereby moving said keys from said first to said second position.

3,934,794
VOTING MACHINE WITH BAND INTERLOCK

Cothburn M. O'Neal, Dallas, Tex., assignor to The Riverside Press, Inc., Dallas, Tex.

Filed June 3, 1974, Ser. No. 475,418
Int. Cl.² G07C *13/00*
U.S. Cl. 235—54 A **19 Claims**



1. In a voting machine having a plurality of aligned voting keys, each of said keys being moveable between an unvoted position and a voted position, a mechanical interlock comprising:

a plurality of cam means each associated with one of said keys,

a plurality of slide means each adjacent one of said cam means for sliding in response to movement of said keys from the unvoted position to the voted position,

a plurality of pivot members each associated with one of said keys rotatably mounted for rotating in response to the sliding of one of said slide means, and

means for selectively interlocking certain of the pivot members associated with certain of said voting keys including common means for interconnecting each of said certain pivot members and blocking means removably attached to said each of said certain pivot members for contacting said common means to block rotation of said certain pivot members in response to a predetermined number of said certain voting keys having been moved to the voted position, whereby subsequent movement of additional of said certain voting keys to the voted position is prevented.

3,934,795
DUAL DUCT VARIABLE VOLUME AIR CONDITIONING SYSTEM

Le Roy Glnn; Le Royce Glnn, both of San Leandro, and Dainy Travaglio, Kensington, all of Calif., assignors to Universal Pneumatic Controls, Inc., Oakland, Calif.

Filed Feb. 1, 1974, Ser. No. 438,591
Int. Cl.² F24F *13/04*
U.S. Cl. 236—13 **31 Claims**

1. A variable volume conditioned air distribution system for supplying a regulated volume of conditioned air to a room or other space and comprising,

a first, cold duct for supplying cold air,

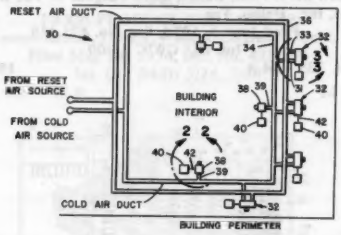
a first movable member in the first, cold duct for regulating the volume of air flowing through the duct,

a second, reset duct for supplying either hot air in a first mode of operation or cold air in a second mode of operation,

a second movable member in the second, reset duct for regulating the volume of air flowing through the duct,

and control means for positioning the first and second movable members in response to temperature in the room and effective to supply in sequence either a controlled vari-

able volume of hot air from the reset duct alone on demand or a controlled variable volume of cold air from the cold duct alone on demand in the first mode of operation and effective to reverse the direction of response of the second movable member to temperature change in the second mode of operation from the direction of response



of the second movable member to a similar temperature change in the first mode of operation so that the reset duct can be used as a hot duct with the system supplying either hot or cold air on demand in the heating season and as a cold duct to increase the cooling capacity of the system in the cooling season up to the total combined capacity of the first and second ducts.

3,934,796

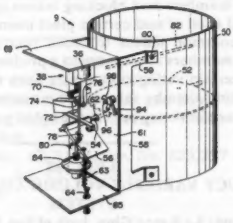
HEATING SYSTEM WITH FUEL SAVING DRAFT RETARDER

Paul E. Smith, Jr., Box 133A, Rte. No. 1, and Lloyd D. Chilcott, Box 95, Rte. No. 1, both of Mays Landing, N.J. 08330

Continuation-in-part of Ser. No. 417,181, Nov. 29, 1973, abandoned. This application Feb. 14, 1974, Ser. No. 442,626

Int. Cl.[2] G05D *23/00*

U.S. Cl. 236—16 **8 Claims**



1. A fuel saving draft retarder for a heating system comprising

a flue section;

a damper mounted in the flue section;

a support on the flue section;

an arm on the damper rotatable in front of the support for opening and closing the damper;

a solenoid mounted on the support and having an armature and a heating system energizable winding;

linkage means connecting the solenoid to the arm for rotating the arm to open the damper when the winding is energized;

means for biasing the damper closed;

heating system control switch means mounted on the support for being engaged and operated by the arm when the damper is open;

a dashpot having an operating rod and spring means normally biasing the operating rod in an extended position;

means for mounting the dashpot on the support such that the operating rod is engaged and depressed by the arm when the arm is rotated to close the damper;

said linkage means including a rod, an eyelet on one end of the rod, a pin pivotally securing the eyelet to the armature of the solenoid, and head means on the other end of the rod; and

said arm having an opening slidably receiving the rod such that the head means engages the arm to rotate the arm to open the damper.

4. A heating system including

means for burning fuel,

fuel control means responsive to electrical energization for controlling a flow of fuel to the burning means,

said burning means including an exhaust stack for combustion products of the burning means,

a one-way air intake valve means for drawing air into the exhaust stack when a draft is being pulled in the exhaust stack and for closing when stack pressure exceeds room pressure,

damper means in the stack past the one-way air intake valve means for opening and closing the stack,

thermostat means for sensing temperature,

primary burner electrical control means operated by the thermostat means for energizing the fuel control means when the sensed temperature is below a selected temperature and for deenergizing the fuel control means when the sensed temperature is above the selected temperature,

means responsive to the primary burner control means for opening the damper means when the primary burner control means is energized and for closing the damper means when the primary burner control means is deenergized, and

switch means operated by the damper opening and closing means and interposed between the primary burner control means and fuel control means for allowing operation of the fuel control means only when the damper means is open.

3,934,797

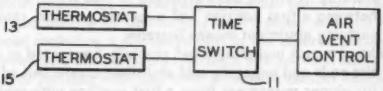
INDIVIDUAL ROOM TEMPERATURE CONTROL SYSTEM

Neal Robert Perlmutter, 7324 A Mill Run Apts., Fort Wayne, Ind. 46819

Filed May 28, 1974, Ser. No. 473,497

Int. Cl.[2] F24F *11/06*

U.S. Cl. 236—46 **7 Claims**



1. A temperature control system for an individual room of a home or similar air which is typically occupied during certain hours of the day and unused during other hours of the day and which receives air from a forced air duct connecting to a central unit comprising:

a pair of thermostatically controlled switches each changing state at an individually selectable temperature;

electrically controllable means for selectively opening and closing the duct including means in the air duct mechanically movable between air passing and air blocking positions, electrically energizable means for moving the mechanically movable means cyclically between the air passing and air blocking positions so long as the electrically energizable means is energized, and a pair of normally closed switches one of which opens only when the mechanically movable means is in the air passing position

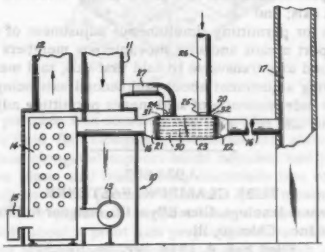
and the other of which opens only when the mechanically movable means is in the air blocking position with each normally closed switch being coupled to the electrically energizable means to tentatively stop the mechanically movable means when one of the normally closed switches opens; and

means for selectively connecting one of the thermostatically controlled switches to the electrically controllable means.

3,934,798
HEAT SAVING APPARATUS

Morris Goldsmith, Port Chester, N.Y., assignor to Partnership of Goldsmith, Josephson & Gulko, Arlington, Va.

Filed Nov. 1, 1974, Ser. No. 520,183
Int. Cl.² F24B 7/02
U.S. Cl. 237—55 5 Claims



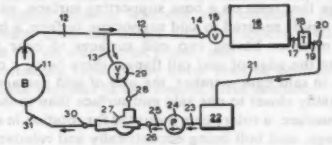
1. In a forced draft home heating system comprising a furnace having a return plenum, a supply plenum, fan means for circulating air through an air circulating system including said furnace and said plenums, a combustion chamber, a chimney, a flue communicating therebetween and means for combustion gases to flow through said chamber, flue and chimney, the improvement comprising a heat exchanger interposed along a portion of the length of said flue, said heat exchanger having opposed tapered collars which engage with said flue and connect with a casing of enlarged cross-section extending therebetween, said casing enclosing a plurality of longitudinal tubes extending between opposed end plates from one collar to the other and providing a chamber within said casing and outside of said tubes, openings at opposite ends of said casing, the opening at one end of said casing being connected to a return register in said air circulating system and being separate from said return plenum, and the opening at the other end of said casing being connected to said return plenum to interconnect the existing fan means in said furnace with said return register via said chamber and said return plenum so that some of the air entering the furnace is preheated while the remainder of the air circulating in the system is not preheated.

4. In a forced draft home heating system comprising a furnace having a return plenum, a supply plenum, fan means for circulating air thorugh an air circulating system including said furnace and said plenums, a combustion chamber, a chimney, a flue communicating therebetween and means for combustion gases to flow through said chamber, flue and chimney, the improvement comprising a heat exchanger interposed along a portion of the length of said flue, said heat exchanger having opposed collars which engage with said flue and connect with a casing of enlarged cross-section extending therebetween, said casing enclosing a plurality of longitudinal tubes extending between opposed end plates from one collar to the other and proving a chamber within said casing, said tubes having approximately the same cross-sectional area as said flue, openings at opposite ends of said casing, the opening at one end of said casing being connected to said return plenum to interconnect the existing fan means in said furnace with the opening on the other end of said casing via said chamber within said casing and said return plenum so that some of the air entering the furnace is preheated while the remainder of the air circulating in the system is not preheated, said opening on the other end of said casing being separate from said return plenum.

3,934,799
HIGH-CAPACITY STEAM HEATING SYSTEM

Francis R. Hull, 567 East 26th St., Brooklyn, N.Y. 11210

Division of Ser. Nos. 889,262, Dec. 3, 1969, abandoned, and Ser. No. 752,120, July 22, 1968, abandoned, and Ser. No. 690,040, Nov. 14, 1967, abandoned, and Ser. No. 621,381, Jan. 23, 1967, abandoned, and Ser. No. 403,244, Oct. 12, 1964, abandoned, and a continuation-in-part of Ser. No. 284,166, Aug. 28, 1972, abandoned, and a continuation-in-part of Ser. No. 121,795, March 8, 1971, Pat. No. 3,687,867. This application May 13, 1974, Ser. No. 469,475
Int. Cl.² F24D 1/08
U.S. Cl. 237—67 11 Claims

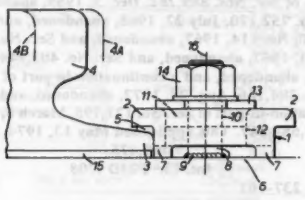


1. A steam heating process in combination: a steam generator or boiler member having integral heating processes; steam-operated heater adapted to receive heating steam supplied by said steam generator member, to condense said heating steam within its internal passageways as heat energy is transferred through its heating surfaces, and to discharge steam condensate therefrom; means for transferring pressurized heating steam from the outlet of said steam generator to the inlet of said steam-operated heater; a fluid-to-fluid contact heat exchanger adapted to effect the contact pre-heating of high-velocity feed liquid by contact interchange in parallel flow with low-velocity heating steam by means of accelerating nozzle and ejector passageways internally disposed within said contact heat exchanger member; a supply of feed liquid suitable for evaporation within said steam generator member; a liquid feed pump; means for transferring the said supply of feed liquid to the suction of said feed pump; means for transferring pressurized feed liquid from said feed pump to a nozzle passageway of said contact heat exchanger; means for transferring pressurized heating steam from the outlet of said steam generator to the ejector passage of said contact heat exchanger; valve regulating means disposed to control flow of said heating steam into the ejector passageway of said contact heat exchanger to regulate heat absorption by feed liquids passing therethrough; and means for transferring the heated feed liquid discharge of said contact heat exchanger to heating processes of said steam generator; the said contact heat exchanger being adapted to receive and exchange energy between high-velocity feed liquid and heating steam in parallel flow within internal fluid passageways thereof, to combine the thermal energy of the several entering fluid streams, and to discharge pressurized and pre-heated feed liquid from a diffuser passageway thereof; whereby the external effect of the contact feed heating process is to substantially separate the sensible heating of boiler feed liquid from the latent heating for evaporation of said boiler feed liquid within said steam generator, thereby increasing heat transfer capacity and steaming capacity of said steam generator member.

3,934,800
TRACK RAIL ANCHORAGES

George Molyneux, Gloucester, England, assignor to Molyneux Rail Clips Limited, Gloucester, England

Filed Apr. 15, 1974, Ser. No. 461,123
Claims priority, application United Kingdom, Apr. 17, 1973, 18348/73
Int. Cl.² E01B 9/30
U.S. Cl. 238—341 1 Claim

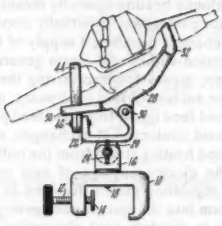


1. In combination with a track rail having a bottom rail flange that rests on a base supporting surface, an upstanding bolt rigidly secured to said supporting surface, a base anchorage member having two end surfaces to bear against and locate the edge of said rail flange, there being a circular passage in said base member, the axis of said passage being substantially closer to one said end surface than to the other said end surface, a rotary cam mounted for rotation in said circular passage, said bolt being eccentrically and relatively rotatably received in said cam, a flange projecting from each said end of said base member, and feet on said base member supporting said base member on said supporting surface, said end flanges being of a height above said supporting surface such that said feet rest on said supporting surface when either of said flanges on said base member overlies said bottom rail flange and a said end surface contacts said bottom rail flange.

3,934,801
FISHING ROD HOLDER

Raymond A. Johnson, 233 Center St., Manchester, Conn. 06040

Filed Oct. 15, 1974, Ser. No. 514,666
Int. Cl.² A01K 97/10
U.S. Cl. 248—41 8 Claims



1. A holder for a fishing rod comprising:

clamp means, said clamp means being adapted to engage a supporting structure for mounting the holder from such structure;

a pair of movable jaw members, said movable jaw members being pivotally mounted on said clamp means and cooperating to define a rod receiving opening therebetween, said movable jaw members having an open position whereby a portion of a rod may be inserted therebetween and a closed position wherein a thus inserted rod will be releasably held therebetween;

rod support means, said rod support means comprising a first pair of fingers which define a first rod receiving recess therebetween, said rod support means further comprising a second pair of fingers which define a second recess therebetween;

means engaging said rod support means intermediate said first and second pairs of fingers for pivotally mounting said rod support means from said clamp means, said mounting means orienting said rod support means to align said first rod receiving recess with the opening defined by said movable jaw members and to position said second pair of fingers exteriorly of and in engaging relationship with said movable jaw members whereby movement of said rod support means in a first direction causes said second pair of fingers to operate said movable jaw members to the closed position;

said movable jaw members being weighted to bias said movable jaw members to said open position;

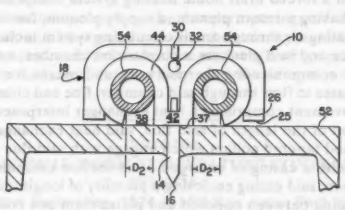
means for permitting simultaneous adjustment of said rod support means and said movable jaw members about a first axis; and

means for permitting simultaneous adjustment of said rod support means and said movable jaw members about a second axis transverse to said first axis, said means permitting adjustment about said second axis being adjustable independently of said means permitting adjustment about said first axis.

3,934,802
TUBE CLAMPING FASTENER

Ralph Ernest Jennings, Glen Ellyn, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,511
Int. Cl.² F16B 15/00
U.S. Cl. 248—71 15 Claims



1. A fastening device for the attachment of tubing or the like to a support surface, comprising a shank, a head member at one extremity of the shank and a support surface penetrating point at the opposite extremity, the head member including at least one tubing receiving and clamping recess opening toward the penetrating point of the shank, the peripheral surface of the recess defining top and opposing side wall portions, an inner side wall portion disposed adjacent the shank axis and an outer side wall portion spaced outwardly from the shank axis with the lowermost extremities of the side walls defining the mouth of the recess, a flexible recess liner means mounted on the device for juxtaposed relationship with the peripheral surface of the recess, the recess liner, in cooperation with the recess, defining a predetermined mouth opening which is at least as great as the maximum transverse dimension of an associated tubing to permit entry of the tubing into the recess, the head including a bight portion interconnecting a leg portion extending downwardly therefrom, the inner surface of the leg portion forming the outer side wall of the recess, said outer side wall surface including a segment adjacent the lowermost extremity of the leg which is angled toward the shank, the lowermost extremity of the recess liner means being mounted intermediate the penetrating point and the mouth of the recess wherein the liner means is adapted to be forced upwardly on the device to generally follow the contour of the peripheral surface of the recess as the shank is driven into the support surface, the angled segment directing

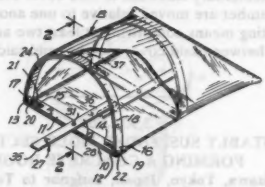
the liner means inwardly toward the shank decreasing the predetermined mouth opening beneath the associated tubing.

3,934,803

BAG DISTENDING AND SUPPORTING APPARATUS

Lawrence Frederick Paulus, Jr., Pleasantville, N.Y., assignor to Lawrence Frederick Paulus, Jr.; Gordon Asch and Mark T. Basseches, all of Pleasantville, N.Y.

Filed Oct. 8, 1974, Ser. No. 513,109
Int. Cl.² B65F 1/04; B65B 67/12
U.S. Cl. 248—99 9 Claims



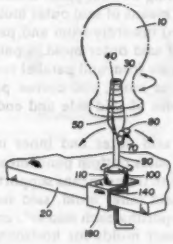
1. A portable free-standing bag distender apparatus comprising a rigid, flat, elongated, horizontal base plate, a generally planar elongated support blade adjacent and parallel to said base plate, said blade being essentially free of portions extending out of the plane of said blade, pivot means connecting said base plate and support blade for relative angular movement about a pivot axis perpendicular to the planes of said plate and blade, said pivot extending through said blade at a substantially medial position relative to the longitudinal axis of said blade whereby, when said blade is rotated about said pivot axis to offset the longitudinal axes of said plate and blade by 90°, portions of said blade extending to both sides of said plate, and stretcher means mounted on said blade, said stretcher means being resiliently deformable in a plane above and normal to said plate and blade, said stretcher means and plate together defining an open mouth expansible in a vertical plane and adapted to retain in open position thereover the vertically arrayed receiving end of a bag by expansion against the interior of said bag.

3,934,804

SUPPORT FOR MANNEQUIN HEADS

Donald G. Bruce, Antioch, Calif., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Jan. 8, 1975, Ser. No. 539,261
Int. Cl.² A45D 44/14; A41H 5/00; A41G 3/00; A47F 5/00
U.S. Cl. 248—229 3 Claims



1. A device for supporting a mannequin head and adapted to be secured to a table, said device comprising:

first and second upwardly extending elongated jaws pivotally secured together at a common point intermediate upper and lower ends of the jaws, the first jaw being fixed, the second jaw being pivotable in a vertical plane about the first jaw, both jaws having vertically spaced ridges which are aligned when the jaws are disposed together to define vertically spaced outer circular ridges, said jaws when disposed together defining a vertical truncated cone having said ridges on the outer surface;

a vertical rod secured at its upper end to the lower end of the first jaw and extending downward;

a sphere secured to the lower end of the rod;

a hollow enclosure with a horizontally disposed annular top lip of interior radius less than the radius of the sphere, the sphere being disposed inside the enclosure with the rod extending upward therefrom through the circular hole defined by the lip, said enclosure having an open region extending downward from the sphere to the bottom of the enclosure, said region having a peripheral horizontal circular groove;

a wedge shaped to fit into said open region and disposed therein, said wedge pressing upwards against the sphere, said wedge having an outer peripheral circular groove aligned with the groove in the region, said wedge being adapted to rest upon said table;

a circular ring fitting loosely within the aligned grooves to hold the wedge inside the enclosure;

an adjustable clamp adapted to engage the edge of the table and secured to the bottom of the enclosure leaving said open region exposed whereby said enclosure presses downward upon the wedge and said sphere is pressed against the lid and cannot rotate; and

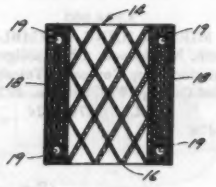
means extending through the lower ends of both jaws to lock same together in any desired pivot position.

3,934,805

APPLIANCE BASE

George Elaschuk, Mississauga, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Sept. 23, 1974, Ser. No. 508,194
Claims priority, application Canada, Oct. 3, 1973, 182593
Int. Cl.² B65D 85/00
U.S. Cl. 248—346 8 Claims



1. A base member comprising a top and bottom panel, a reinforcement extending between and spacing said top and bottom panels, said reinforcement having a pair of beam members positioned one at each side of said base and a reinforcing filler in the space between said beam members, said reinforcing filler being formed by an expanded honeycomb material oriented so that the longitudinal axes of apertures formed through the expanded honeycomb extend substantially perpendicular to said top and bottom panels, said beams being formed of honeycomb material oriented in the same manner as said expanded honeycomb forming said filler, said honeycomb material of said beams being expanded to a lesser degree than said expanded honeycomb material of said filler.

3,934,806
BI-LEVEL BOOK STAND

David M. Rady, 4742 Rolando, San Diego, Calif. 92115

Filed Oct. 9, 1974, Ser. No. 513,274
Int. Cl.² A47B 97/04
U.S. Cl. 248—441 4 Claims

1. A book stand comprising:

a frame having a base and a shaft mounted to said base such that said shaft extends vertically upwardly from said base when the latter is disposed on a horizontal surface, the upper portion of said shaft defining an elongated vertical channel therein;

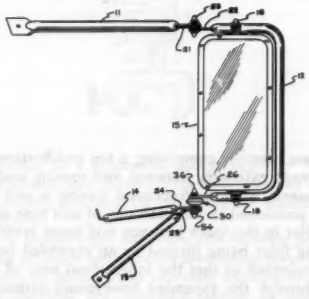
a tray having an inclined post mounted to the rear thereof and dimensioned to snugly seat in said channel whereby said tray is removably mountable substantially above said shaft and at an angle thereto; and

said base including a mounting socket for snugly and removably receiving said post, whereby said tray is alternatively mountable on said shaft and in said socket.

3,934,807
MIRROR JOINT ASSEMBLY

Harold S. Boutin, Northwood, Ohio, assignor to The Acme Specialty Manufacturing Company, Toledo, Ohio

Filed Oct. 1, 1973, Ser. No. 402,466
Int. Cl.² A47G 1/24
U.S. Cl. 248—478 6 Claims

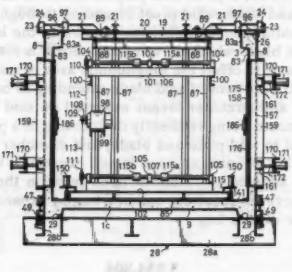


1. A mirror joint assembly comprising, in combination, a cover member defining first cooperating members on its inner surface, a clutch member adjacent said cover member, said clutch member including second cooperating members complementary with said first cooperating members, attaching means operatively connected to said cover member for attaching said cover member to a support, connecting means operatively attached to said clutch member for connecting said clutch member to a support, a bottom member adjacent said clutch member and separate from said cover member, said cover member and said bottom member having complementary sidewalls with mating surfaces, spring means positioned between said bottom member and said clutch member for urging said first and second cooperating members into an engaging relationship, means for variably adjusting the spring force of said spring means, whereby said mating surfaces of said complementary sidewalls of said cover member and said bottom member are moved relative to one another, said variable adjusting means comprising at least two adjusting screws extending between said cover member and said bottom member.

3,934,808
ADJUSTABLY SUSPENDED MOLD SECTIONS FOR FORMING A CONCRETE ROOM

Masuji Aizawa, Tokyo, Japan, assignor to Taihei Company Ltd., Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,369
Claims priority, application Japan, Sept. 11, 1973, 48-102334; May 2, 1974, 49-48722
Int. Cl.² E04G 11/02
U.S. Cl. 249—27 38 Claims



1. A molding device for producing a box-type concrete block, comprising:

an outer mold including bottom panel means, a pair of opposed parallel side panels, and a pair of opposed parallel end panels at right angles to said side panels;

an inner mold including bottom panel means spaced above said bottom panel means of said outer mold, a pair of side panels each spaced inwardly from and parallel to one of said side panels of said outer mold, a pair of end panels each spaced inwardly from and parallel to one of said side panels of said outer mold, and corner panel means between adjacent ones of said side and end panels of said inner mold; and

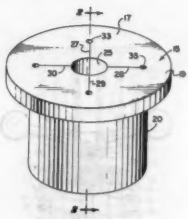
support means for said outer and inner molds including means supporting saids bottom panel means of said outer mold and suspension frame means supporting said bottom panel means of said inner mold, said suspension frame means further supporting each said side and end panels of said outer and inner molds for horizontal linear movement inwardly and outwardly relative to the corresponding bottom panel means, and said suspension frame means supporting each of said corner panel means independent of the side and end panels for horizontal movement toward and away from the corresponding ones of said adjacent side and end panels along a linear path generally bisecting the corner between said corresponding ones of said adjacent side and end panels.

3,934,809

SLITTED FLEXIBLE MOLD

Robert H. Fox, Hoffman Estates; Robert J. Henning, Crystal Lake, and Miroslav Psensky, Cary, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 4, 1974, Ser. No. 529,335
Int. Cl.² B28B 7/06, 7/20
U.S. Cl. 249—117 3 Claims



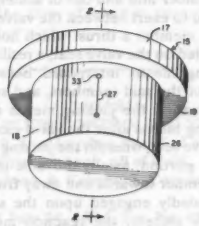
1. In an integral flexible distensible mold having wall portion defining a shaping cavity therein, the improvement comprising: a closed openable slit in said wall portion, said slit extending from at least a portion of the wall of the shaping cavity and only partly through the wall portion of the mold, the slit including an enlarged marginal portion thereof at the outward extreme thereof.

3,934,810

FLEXIBLE MOLD

Robert J. Henning, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 4, 1974, Ser. No. 529,336
Int. Cl.² B28B 7/06, 7/20
U.S. Cl. 249—117 3 Claims



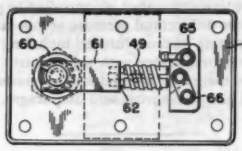
1. In an integral flexible distensible mold having a wall portion defining a shaping cavity therein, the improvement comprising: a closed openable slit in said wall portion, said slit extending from at least a portion of the exterior of the wall of the mold and only partly through the wall of the mold wherein no part of the slit extends into the shaping cavity and in which the slit includes an enlarged radially inward marginal portion thereof at the inner extreme thereof.

3,934,811

ADJUSTABLE THERMAL VALVE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Division of Ser. No. 432,457, Jan. 11, 1974, Pat. No. 3,870,457, which is a continuation of Ser. No. 223,451, Feb. 4, 1972, abandoned. This application Dec. 26, 1974, Ser. No. 536,351
Int. Cl.² G05D 15/01
U.S. Cl. 251—11 3 Claims



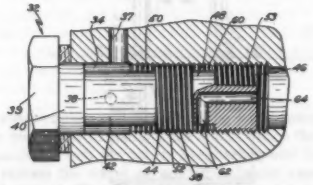
1. Thermal valve means comprising a housing having an inlet and an outlet orifice, a valve element normally spring biased closing against said orifice by a support including a heat warpable section, a resistance heater for warping the support to move the element away from the orifice and thereby open the same, said housing enclosing the valve element and its support in fluid tight relation and open only at said inlet and said orifice, and means operable from the exterior of said housing for adjusting the normal orifice closing force of the element with the housing in such closed condition and thus without diminishing the fluid tight integrity of said housing during such adjustment.

3,934,812

VALVE CONSTRUCTION AND FLOW RESTRICTOR FOR USE THEREWITH

Alfred W. Pett, Warwick, R.I., assignor to New England Union Co., West Warwick, R.I.

Filed Apr. 28, 1975, Ser. No. 572,619
Int. Cl.² F16K 31/385, 31/40
U.S. Cl. 251—45 6 Claims



1. A valve construction for controlling flow of a fluid therethrough, comprising a body portion to which an inlet pipe and an outlet pipe are connected, an inlet chamber communicating with said inlet pipe and an outlet chamber communicating with said outlet pipe, a movable diaphragm located in said body portion and normally sealing communication between said inlet and outlet chambers, an interior chamber formed in said body portion between said diaphragm and a wall of said body portion, an interior pilot valve located in said body portion and that is operable to induce flow of fluid to and from said interior chamber for controlling the pressure differential across said diaphragm, wherein the diaphragm is flexed in accordance with the pressure differential thereacross to control communication between said inlet and outlet chambers, and means communicating with said inlet chamber and said interior chamber for restricting flow of fluid to and from said interior chamber so as to prevent too rapid closing of said diaphragm and thereby preventing water hammer from occurring in said pipes, said flow restricting means including an

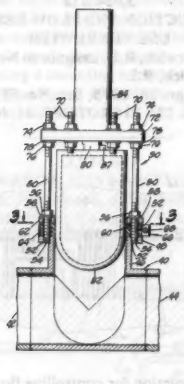
elongated cylindrical control chamber that directly communicates with said pilot valve, a restrictor member located in said control chamber and including a first threaded portion that threadably engages a first threaded section of said control chamber to positively locate said restrictor member therein, a second threaded portion of said restrictor member cooperating with a second threaded section of said control chamber to define a spirally extending restricted passage, and passage means formed in said restrictor member and communicating with said spirally extending restricted passage and said interior chamber for directing fluid thereto, wherein flow of fluid to and from said interior chamber is controlled to produce gradual changes in the differential pressure across said diaphragm, said flow restricting means further including a secondary chamber that communicates with said control chamber and that cooperates therewith to produce the gradual changes in the differential pressure across said diaphragm.

3,934,813

CONCRETE PUMP VALVE

Robert E. Jackson, Newport Beach, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.

Filed May 14, 1973, Ser. No. 359,706
Int. Cl.² F16K 31/163
U.S. Cl. 251—62 **27 Claims**



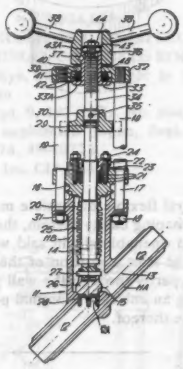
1. A valve comprising a supporting structure, a piston assembly having a closing member at the forward end thereof, said piston assembly being carried by said supporting structure and adapted for reciprocal movement therein, an annular sealing member carried by said supporting structure and supporting said closing member, said sealing member defining inner and outer wall portions, said inner wall portion being positioned about and in sealing engagement with said closing member, an annular band positioned about said outer wall portion of said sealing member and means carried by said band for tightening said band about said outer wall portion of said annular sealing member whereby said inner wall portion of said sealing member is radially pressed against said closing member.

3,934,814

FLUID-FLOW CONTROL VALVE

Peter Orszak, Oadby, England, assignor to The English Electric Company Limited, London, England

Filed Apr. 22, 1974, Ser. No. 462,736
Claims priority, application United Kingdom, Oct. 23, 1973, 49215/73
Int. Cl.² F16K 31/50
U.S. Cl. 251—80 **9 Claims**

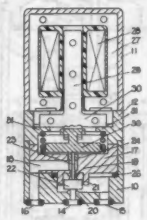


1. A fluid-flow control valve comprising a valve body defining a fluid-flow aperture and having a valve seat surrounding the aperture, a valve closure member movably mounted in the body, a reaction member secured on the body in fixed position relative to the valve seat, jacking means operable to move the valve closure member into and out of seating engagement on the valve seat and to exert between the valve closure member and the reaction member a thrust which holds the valve closure member seated on the valve seat, a resiliently deformable thrust-transmitting means interposed between the jacking means and one of the said members, and stop means which limits the deformation the jacking means can effect in the thrust-transmitting means after the valve closure member has seated on the valve seat, wherein the jacking means comprises a threaded shaft portion, axially movable in unison with the valve closure member towards and away from the valve seat, and a nut threadedly engaged upon the shaft portion and rotatable relative thereto, the reaction member having an aperture in which the nut is rotatably mounted and a face surrounding said aperture and directed towards the valve seat, the nut having a face opposed to said face of the reaction member and there being provided a thrust bearing, disposed around the nut and between these two faces, and means which secures the shaft portion against rotation relative to the reaction member, and wherein the shaft portion of the jacking means extends through the nut thereof and has a part which is more remote from the valve seat than is the nut, and the stop means is secured on the said part and limits axial movement of the shaft portion, relative to the nut, in the direction towards the valve seat.

3,934,815
FLUID CONTROL VALVES

John Thomas Marsden, Stoke-on-Trent, England, assignor to Expert Industrial Controls Ltd., England

Filed Mar. 27, 1975, Ser. No. 562,784
Claims priority, application United Kingdom, Apr. 2, 1974, 14460/74
Int. Cl.² F16K 31/06
U.S. Cl. 251—129 4 Claims



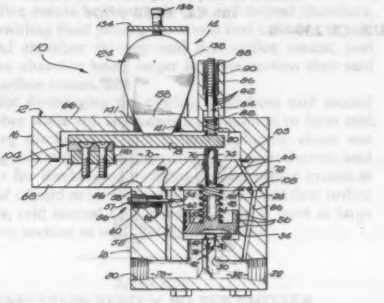
1. A fluid control valve of the kind specified comprising a T-shaped armature, said armature having side plates, extensions on said side plates which extend beyond the head of the armature, the end portions of said extensions extending substantially at right angles to the remaining portions of the extensions, a spring abutment movable in the housing, a coiled compression spring defining said resilient means, said spring engaging said abutment to urge the abutment into contact with a stem on the valve member thereby to urge the valve member into contact with the seating defined about said one aperture, means carried by the abutment and engageable by the end portions of said extensions when in use electric current is supplied to a solenoid forming part of said electromagnetic means, the flow of current in the solenoid causing the armature to move the abutment in a direction away from the valve member to allow the valve member to be displaced by the air pressure, and stop means defined in the housing and which arrests the movement of the armature towards the valve member when the flow of electric current in the solenoid ceases.

3,934,816
FLUID CONTROL VALVE

Melvin L. Terrell, Los Angeles; Paul F. Lange, Downey, and James B. Doolittle, Burbank, all of Calif., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Filed July 24, 1974, Ser. No. 491,215
Int. Cl.² F16K 31/02
U.S. Cl. 251—141 5 Claims

1. An electromagnetically operated control valve comprising: a housing having a valve port and a magnetically attractable armature therein adjacent to said port, said housing having an inlet and an outlet, but being otherwise sealed; magnetic control means on said housing including a core assembly having a pair of pole pieces, said armature being disposed within the range of magnetic influence of said control means, actuation of said control means shifting said armature in directions toward and away from said valve port to control fluid flow therethrough, means mounting said coil assembly outside of said housing adjacent to a wall thereof; and a pair of pole extensions sealed in said wall in alignment

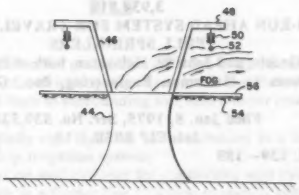


with said pole pieces, said armature being disposed adjacent to said pole extensions.

3,934,817
PRECIPITATION OF STEAM FOGS

Robert E. Barry, Ann Arbor, and Vincent J. Herter, Livonia, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Mar. 7, 1974, Ser. No. 448,925
Int. Cl.² A01G 15/00
U.S. Cl. 239—2 R 22 Claims

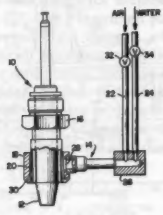


1. A water cooling system for cooling water comprising heat transfer means for contacting the water with a flow of air to simultaneously heat the air, to evaporate water into the air, and to release the warm air containing water vapor into the atmosphere, a traffic area such as a highway or airport in the vicinity of said cooling system in position to receive a dense fog from said cooling system under fog favoring atmospheric conditions and a prevailing wind moving from the cooling system toward the said area, fog dissipating means interposed between the cooling system and area comprising means for establishing a high voltage electrical field through which air traversing the cooling system passes on its way to the traffic area, said fog dissipator being located in horizontally spaced relation to said cooling system such that under meteorological conditions effective to produce substantial fog conditions at said traffic area by condensation of water vapor and migration of fog so produced, substantial condensation of water vapor into fog particles occurs before reaching said fog dissipating means, the fog dissipating means comprising one or more horizontally extending conductors spaced above the path of passage of fog from the traffic area, grounded structure disposed directly below such conductors and below such path, and means for establishing a high voltage unidirectional field between the conductors and ground.

3,934,818
METHOD OF OXY-FUEL CUTTING

Cornelius Seamans Arnold, Cranford, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1972, Ser. No. 316,997
Int. Cl.² B05B 17/04
U.S. Cl. 239—8 1 Claim



1. In a method of oxy-fuel gas cutting of relatively thin steel plate wherein a high temperature cutting flame is directed at a portion of said plate to be cut, the improvement of which comprises:

passing a stream of air into a mixing zone adjacent said nozzle at a rate of between 75 to 100 cu.ft/hr at 15 to 25 psig;

passing a stream of water into said mixing zone at a rate of between 10 to 15 gal. per hr;

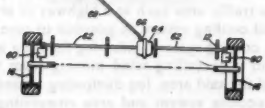
discharging the admixture of said water and air from said mixing zone to form an atomized aerosol mist; and

directing said mist in the form of a curtain about said cutting flame and as close as possible thereto without causing physical interference therewith.

3,934,819
ANTI-RUN AHEAD SYSTEM FOR TRAVELING HOSE PULL SPRINKLERS

Jay C. Groelz, and John W. Heinzman, both of Phillips, Nebr., assignors to Heinzman Engineering, Inc., Grand Island, Nebr.

Filed Jan. 8, 1975, Ser. No. 539,526
Int. Cl.² B05B 3/18
U.S. Cl. 239—189 9 Claims

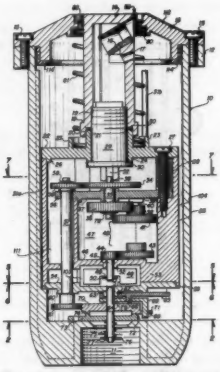


6. In combination with a mobile irrigation chassis of the type including supportive wheel means, coupling means for coupling to a source of high pressure water and rotary torque developing means having rotary power output means as well as a rotatable winding member to which one end of a field anchored pull cable is attached for winding therealong for advancing said chassis along a field to be irrigated, flexive torque transfer means drivingly coupling said output means to said winding member, brake means operatively associated with said wheel means for selectively braking the latter and including oscillatable actuator means, and flexure sensing means operatively associated with said torque transfer means to sense the flexure thereof and operatively connected to said actuator means for oscillating the latter in response to variations in flexure of said torque transfer means.

3,934,820
SPRINKLER CONTROL

Charles W. Phaup, Dallas, Tex., assignor to Telsco Industries, Dallas, Tex.

Filed Aug. 23, 1974, Ser. No. 500,051
Int. Cl.² B05B 15/10, 3/16
U.S. Cl. 239—205 33 Claims



1. In a pop-up, rotary sprinkler system having an outer housing, a nozzle head vertically and rotatably movable through an outer housing cover, and an inner housing attached to the nozzle head and slidably received within said outer housing, such inner housing enclosing an adjustable direction controlling mechanism and a transmission driven by a water-wheel impeller, the combination which comprises:

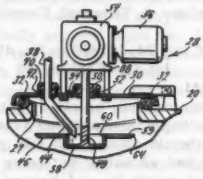
a. convex thrust rings integrally formed with cover and partition plates within said inner housing having surfaces confronting surfaces of rotating members of said transmission; and

b. resilient means to maintain said surfaces in contact with one another.

3,934,821
BULK COOLER AND STORAGE TANK

Paul Mueller; Robert B. Cannon, and Ray A. Prine, all of Springfield, Mo., assignors to Paul Mueller Company, Springfield, Mo.

Filed May 6, 1974, Ser. No. 466,968
Int. Cl.² B05B 3/10; B44D 5/10; F23D 11/04
U.S. Cl. 239—224 11 Claims



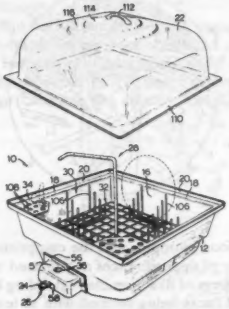
1. A device for distributing a liquid having a horizontally disposed disc, means to rotate the disc about a vertical axis, means for supplying a liquid to the upper surface of the disc, means for uniformly distributing the liquid on the upper sur-

face of the disc, and means to isolate the distributing means from mechanically generated heat.

3,934,822
WATER POWERED DISHWASHER

Jack Ross, 230 Richmond St. East, Toronto, Ontario, Canada

Filed July 29, 1974, Ser. No. 492,393
Int. Cl.² B05B *3/00*; A62C *5/02*; B05B *7/26*; B08B *3/00*
U.S. Cl. 239—226 17 Claims

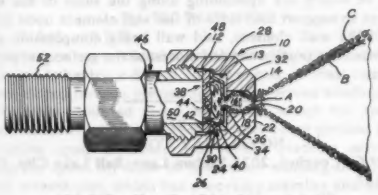


1. A soap dispenser for a water powered dishwasher, suitable for dispensing soap from storage to be mixed uniformly with water passing through a water inlet, the dishwasher having a container shell and top defining a washing and rinsing cavity therebetween a water inlet extending from one side of the container shell below the bottom of the shell, to the centre thereof into a washing cavity, a water inlet and a water outlet, and rotatable spray means adapted to rotate about the water inlet extending into the cavity, said soap dispenser comprising a soap storage in open communication with the atmosphere through at least a downwardly directed aperture, through which soap is discharged, an upwardly directed opening in the top of the water inlet disposed directly below the downwardly directed aperture for receiving the discharged soap and means in the water inlet when water is passing through the inlet, to cause a continuous suction on the soap discharged from said storage and assist to draw the soap through the opening into the water inlet to be mixed with the water passing therethrough.

3,934,823
LOW DRIFT SPRAY NOZZLE

Kenneth E. Reed, Saint Charles, Iowa, assignor to Delavan Manufacturing Corporation, West Des Moines, Iowa

Filed Nov. 12, 1973, Ser. No. 414,733
Int. Cl.² B05B *1/34*
U.S. Cl. 239—472 14 Claims



1. A nozzle for producing a swirling discharge of a hollow geometric shape having substantially large droplets therein, said nozzle comprising

a first chamber having a fluid inlet for introducing fluid to said first chamber,

swirl means for imparting a swirling motion to the fluid in said first chamber,

a second chamber,

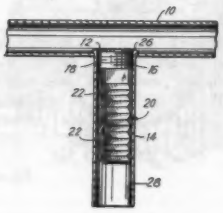
first orifice means between said first and second chambers, said swirling fluid passing from said first chamber to said second chamber through said first orifice means, said second chamber being larger in cross section than said first orifice means, and

means for discharging the swirling fluid from said second chamber while still in its swirling condition to form said swirling discharge of said hollow geometric shape and having said substantially large liquid droplets therein, said means for discharging includng second orifice means at an end of said second chamber opposite said first orifice means, said second orifice means being at least as large in cross section as said first orifice means.

3,934,824
IRRIGATION SYSTEM WATER EMITTER

Davis Fitzhugh, Raspberry Lane, Augusta, Ark. 72006

Filed June 17, 1974, Ser. No. 479,781
Int. Cl.² B05B *15/00*
U.S. Cl. 239—534 3 Claims



1. A water emitter for connection with the longitudinal bore in feeder lines of a drip irrigation system for the distribution of water in said bore to surrounding soil; said emitter comprising

a. a substantially rigid cylinder for attachment to a feeder line of a drip irrigation system;

b. first means on said cylinder for connecting said cylinder to said bore in a feeder line of a drip irrigation system;

c. a substantially rigid annular head;

d. an elongated, flexible, collapsible tube with one end connected to said head;

e. said tube having a plurality of spaced apart crimps disposed therealong to provide when expanded in internal sinuous path for water passing therethrough;

f. opposed cooperating means in one end of said cylinder and on said head for holding said head and its connected tube in said cylinder;

g. said cylinder surrounding said tube along substantially its entire length to protect said tube from surrounding soil in its collapsed state.

3,934,825
PROCESS FOR THE WET GRINDING OF MATERIALS

Pierre Delfosse, Paris, France, and Alfred Bosshard, Oftringen, Switzerland, assignors to Plüss-Staufer AG, Switzerland

Filed Oct. 23, 1973, Ser. No. 408,878
Claims priority, application Germany, July 9, 1972, 2334804The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.² B02C *17/14*
U.S. Cl. 241—16 16 Claims

1. A process for the wet grinding of a material such as chalk, comprising the steps of:

forming a suspension containing particles of said material no coarser than 43 microns; and

grinding said suspension of material with grinding bodies having a weight density of at least 3.7 g/cc and consisting of 30 to 70 weight percent of zirconium oxide, 0.1 to 5 weight percent of aluminum oxide and 5.0 to 20 weight percent of silicon dioxide, wherein the weight ratio of said grinding bodies to said material to be ground is at least 6:1.

3,934,826

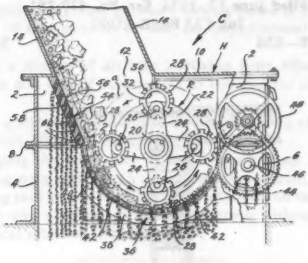
COAL CRUSHER

Donald F. Graveman, St. Charles, Mo., assignor to American Pulverizer Company, St. Louis, Mo.

Filed June 5, 1974, Ser. No. 476,582

Int. Cl.² B02C *13/09*

U.S. Cl. 241—81 **7 Claims**



1. A machine for reducing lump material such as coal, said machine comprising: a rotor which revolves about an axis of rotation in one direction, generating windage as it does, the rotor having breaking elements which describe a hammer circle as the rotor revolves and are capable of moving inwardly toward the axis of rotation upon encountering oversize lumps; a housing supporting the rotor and enclosing the hammer circle, the housing having an upwardly presented opening located above the hammer circle and substantially entirely on that side of the axis along which the breaking elements descend; an apertured cage within the housing and spaced from the lower portion of the hammer circle, the cage being arcuate and generally corresponding in contour to the hammer circle so that large lumps of material introduced into the opening are crushed between the cage and breaking elements and reduced to a predetermined size small enough to pass through the apertures in the cage; and a generally flat apertured plate located between the opening and the upper end of the cage on that side of the axis at which the breaking elements descend and being close enough to the rotor to enable the windage generated by the rotor to impinge against it, the apertured plate forming an upward generally uninterrupted continuation of the cage and being inclined with respect to the vertical such that much of the lump material entering the opening will fall onto and pass over the apertured plate, the apertured plate having holes therein sufficient in size to permit passage of material of substantially said predetermined size but not larger, the apertured plate and holes therein extending above the hammer circle, whereby much of the material which is of the predetermined size or smaller will fall through the apertured plate before being impacted by the breaking elements with the windage assisting the passage through the apertured plate, while material larger than the predetermined size will be impacted by the breaking elements and moved along the cage until small enough to pass through the cage.

3,934,827

DIE FOR TWO-STAGE FOOD CHOPPER

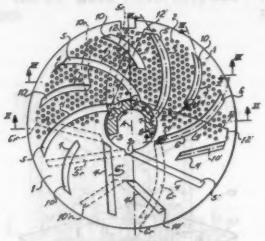
Ludwig Seydelmann, 1, Holderlinstra, 7 Stuttgart, Germany

Filed Sept. 3, 1974, Ser. No. 502,751

Claims priority, application Germany, Sept. 3, 1973, 2344284

Int. Cl.² A47J *43/07*

U.S. Cl. 241—84 **13 Claims**



1. A die for a food chopper, said die comprising a metallic plate having a pair of opposite faces and formed with an array of throughgoing bores of like diameter extending between said faces, one of said faces being formed with at least one elongated groove having a width greater than the diameters of said bores, said food chopper pressing material to be chopped against said one face and having a blade rotated about an axis perpendicular to said face to sweep over said one face, said groove being inclined to said blade during sweeping of said blade over said groove.

3,934,828

WEAR-RESISTANT WALL LININGS FOR SHELLS OF MILLS AND LIKE APPARATUSES

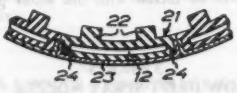
Bo Klas Gerhard Persson, Hollviksnas, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden

Filed May 17, 1974, Ser. No. 471,108

Claims priority, application Sweden, May 18, 1973, 73070443

Int. Cl.² B02C *17/22*

U.S. Cl. 241—102 **2 Claims**



1. A wall which is subjected in use to wear and which is made of wall segments, each of said wall segments including a wall element made of an elastomeric material, each of said wall elements having at least one inner cavity containing pressure fluid, each of said wall segments having a cup-shaped supporting element secured to a said wall element and having edges of which are upstanding along the sides of the wall element to support said sides of the wall element upon inflation of the wall element, said wall being compression prestressed in the portion thereof closest to the surface subjected to wear.

3,934,829

NOVEL WAY SYSTEM

Robert G. Coucher, 2021 Ribbon Lane, Salt Lake City, Utah 84117

Filed Aug. 26, 1974, Ser. No. 500,272

Int. Cl.² B02C *7/14*

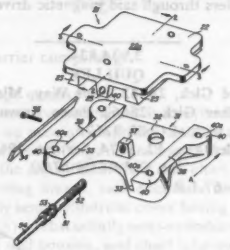
U.S. Cl. 241—259.1 **4 Claims**

1. A way system for selectively advancing and retracting an electric motor along its axis, comprising:

a first way element, including a stationary mounting plate with a flush-mounting surface, a pair of parallel way surfaces depending from said mounting plate opposite said flush-mounting surface, and a first adjusting lug depending from said mounting plate between said depending way surfaces;

a second way element, including a movable support plate, a pair of parallel way surfaces upstanding from said support plate and arranged to register with respective said depending way surfaces, and a second adjusting lug upstanding from said support plate between said upstanding way surfaces;

a shaft with a first threaded portion engaged by threads in one of said adjusting lugs, a second portion journaled through the second adjusting lug, and a distal end portion extending beyond said plates, constituting adjusting means for changing the relative longitudinal position of



said movable support plate with respect to said stationary mounting plate;

parallel motor support platforms associated with each of said upstanding way surfaces and carried approximately parallel said flush-mounting surface of said stationary mounting plate; and

mounting posts upstanding from respective said motor support platforms arranged to register with anchoring slots of a conventional electric motor frame mounting and sufficiently long to provide clearance between the distal ends of said posts and said flush-mounting surface to accommodate a mounting panel such that the mounting plate may be fastened to one side of such a mounting panel with the mounting posts extending through holes provided in said panel, and a motor frame mounting attached to the distal ends of said posts to slightly clear the opposite surface of said mounting panel.

3,934,830

SPOOLING MECHANISM

Gerhard Grau, Albershausen, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Germany

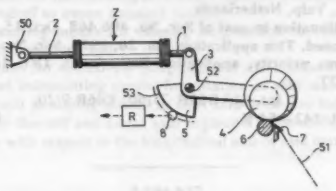
Filed May 28, 1974, Ser. No. 473,758

Claims priority, application Germany, May 28, 1973, 2327164

Int. Cl.² B65H 54/42

U.S. Cl. 242—18 DD **22 Claims**

1. In a spooling mechanism for the winding of textile threads onto spools having a driven winding shaft; at least one spool whose circumference presses against the driven winding shaft; a pivotably mounted spool holder on which the spool is mounted for rotation, said spool holder being pivoted during increasing spool diameter with further pivoting permitting lifting the spool off from its associated winding shaft; and a linear servomotor, which has a working member and an associated guide member, which working member is connected to the spool holder and is mounted to be driven with respect to the guide member for the purpose of executing a displacement, the working member serving for the displacement of the spool holder and being itself displaceable by the spool holder, the improvement comprising: a pretension working element connected to the linear servomotor for causing the joint motion of said guide member of said linear servomotor together with said working member during displacement of the working member by said spool holder to maintain a substantially unchanged, predetermined, relative position between said work-



ing member and said guide member of said linear servomotor during motions of said spool holder; an operating device; and locking means, actuatable by said operating device, which in its locking position allows said working member to execute a working stroke relative to said guide member while taking along said spool holder.

3,934,831

TRAVERSING THREAD GUIDE

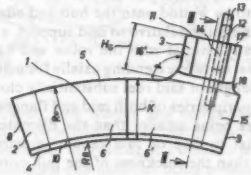
Klaus Bruggisser; Felix Graf, both of Winterthur, and Albert Ruegg, Pfaffikon, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Dec. 10, 1973, Ser. No. 423,501

Claims priority, application Sweden, Dec. 11, 1972, 17959/72

Int. Cl.² B65H 54/30

U.S. Cl. 242—43 **18 Claims**



1. A traversing thread guide for winding a thread and adapted to engage with a helically extending endless cam groove of a traverse cylinder, said cam groove having a bottom, said traversing thread guide comprising an elongated cam engaging portion, a gliding member for linear to-and-fro guiding of the traversing thread guide along a rigid guide device extending substantially parallel to the rotational axis of the traverse cylinder, said gliding member being arranged in offset relationship with respect to the center of the cam engaging portion, a thread guide member rigidly arranged on the gliding member, the center of gravity of the traversing thread guide being located in the cam engaging portion, said cam engaging portion comprising a base for the inner radial guidance of the traversing thread guide, said base possessing a curvature which at least approximates the curvature of the cam groove bottom, said base being in contacting relation with said cam groove bottom, said cam engaging portion further comprising an upper surface servicing for the outer radial guidance of the traveling thread guide on an inside surface of the guide device, said thread guide being freely radially movable with respect to the traverse cylinder between said inside surface of the guide device and the bottom of said cam groove, said gliding member being rigidly connected with the cam engaging portion and being provided with at least one gliding section for contacting a guide edge of the guide device,

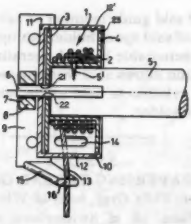
said gliding section enclosing an angle with the upper surface of the cam engaging portion.

3,934,832

REEL ASSEMBLY FOR ROLLER

Edwin Zilver, Doorwerth, Netherlands, assignor to Intersilma B.V., Velp, Netherlands

Continuation-in-part of Ser. No. 406,468, Oct. 15, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,556
Claims priority, application Netherlands, Oct. 18, 1972, 7214127
Int. Cl.² B65H 75/00; E06B 9/20
U.S. Cl. 242—54 R 8 Claims



1. In combination with a blind roller rotatably mounted at opposite ends on a fixed support, a reel hub coaxially and fixedly secured to one end of said roller, axially spaced radial end flanges on the hub, a pull cord secured at one end to the reel adapted to be wound onto the hub and adapted to rotate the reel and the roller relative to said support, a tubular member substantially coaxial with the roller and having an inner circumferential surface extending axially for a distance at least equal to the length of said reel substantially closely surrounding the outer peripheries of both said end flanges, the diameter of said flanges being smaller than the diameter of the inner circumferential surface of said tubular member by a small distance less than the thickness of the pull cord, said tubular member having an aperture permitting free and unfettered passage of the unsecured end of the pull cord through said tubular member, and means for loosely mounting said tubular member on said support comprising cooperating means connected to said tubular member and to said support for preventing free rotation of said tubular member about the axis of said roller but allowing small free axial, radial and tilting movements of said tubular member with respect to said support during rotation of said roller.

3,934,833

HYSTERESIS CLUTCH FOR FILM WINDING

James L. Nash, Glens Falls, and Phillip H. Carrico, Greenfield Center, both of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed Sept. 27, 1974, Ser. No. 510,114
Int. Cl.² B65H 19/04
U.S. Cl. 242—56.9 6 Claims

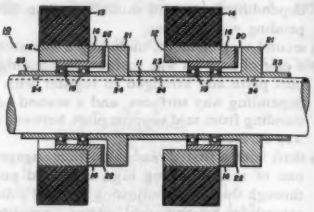
1. A bobbin winding assembly particularly adaptable for simultaneously winding a plurality of synthetic resin strips comprising in combination

a. a drive mandrel,

b. a plurality of bobbin core holders coaxially mounted in spaced array along said shaft for rotation thereon,

c. a hysteresis ring on each of said core holders,

d. and an annular permanent magnet ring fixed concentrically to said mandrel and adjacent each hysteresis ring with an air gap therebetween and in magnetic drive relationship thereto,



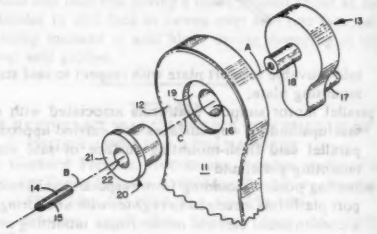
e. so that rotation of said drive mandrel rotates each of said core holders through said magnetic drive across said air gap.

3,934,834

QUILLER

James Edward Gick, 24842 Pylos Way, Mission Viejo, and James Walker Gick, 26662 Paseo Ensenada, San Juan Capistrano, both of Calif. 92675

Filed Aug. 12, 1974, Ser. No. 496,653
Int. Cl.² B65H 17/02
U.S. Cl. 242—67.1 R 2 Claims



1. A quiller for rolling strips of paper into decorative and artistic patterns, comprising:

a body having a flat surface, a hole through the body and through the flat surface of the body and having a recess on the flat surface of the body on one side thereof around the hole of the body;

a cylindrical bushing member having an enlarged shoulder portion on one end thereof adapted to mate with said recess of said body, the cylindrical portion of said bushing extending through said hold of the body and being rotatable therein, the end portion of said bushing member which includes said shoulder portion having a flat surface, said flat surface fitting flush with the flat surface of said body member when said bushing member is disposed in said hole of said body, said bushing member including a hole extending axially therethrough;

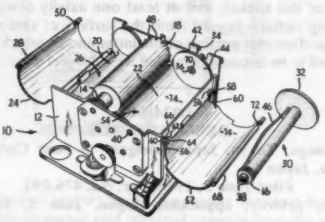
a crank having a crank axis, a handle and a shaft disposed around the crank axis wherein the shaft is mated to the hole of the bushing by press fitting the shaft into the hole of the bushing on the other side of said body so that the crank axis is substantially perpendicular to the flat surface of the body and the crank is rotateable about the crank axis; and

a pin for winding the paper strips, said pin having an axis and having a slot extending axially therethrough for receiving one end of a paper strip, said pin being coupled to the shaft of the crank by being pressed into the shaft so that at least a portion of the pin is beyond the flat surface of the body.

3,934,835
CHART CARRIER FOR RECORDER

John Maxwell, Chatham, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed June 28, 1973, Ser. No. 374,526
Int. Cl.[2] B65H 17/38
U.S. Cl. 242—67.2 3 Claims

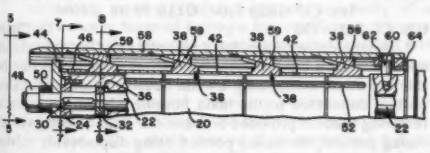


1. A chart carrier comprising:
a. a housing;
b. chart storage means;
c. driving means comprising a driven cylinder;
d. chart take-up means comprising a substantially cylindrical enclosure for rolling and enclosedly retaining the used portion of the chart fed in from said chart storage means by said driving means, said enclosure comprising (i) a substantially semi-cylindrical cover having a rounded free edge, and (ii) a substantially semi-cylindrical base portion disposed in said housing, said chart take-up means further comprising means for pivotally mounting said cover along its outer edge on said housing and means for urging said cover toward said driven cylinder, said cover being operative when in a first position to form said substantially cylindrical enclosure with said substantially semi-cylindrical base portion, and further operative when in a second, pivoted position to expose said substantially semi-cylindrical base portion; and
e. retaining means operative to receive and rotatably retain a removable take-up spool, said retaining means comprising a leaf spring having a fixed end attached to said housing and a free end extending into said substantially cylindrical enclosure near one end thereof, a bushing mounted in said leaf spring near said free end thereof, and a disc having a central aperture therein and mounted near said free end of said leaf spring with said aperture in registration with said bushing, and an opposed end wall having an aperture therein aligned with said bushing in said central aperture of said disc along the axis of said substantially cylindrical enclosure.

3,934,836
MANDREL ASSEMBLY

Danny L. Dunlap; Charles E. Huelsman, and John H. Muhlenkamp, all of Minster, Ohio, assignors to Stamco Division, The Monarch Machine Tool Company, New Bremen, Ohio

Filed July 31, 1974, Ser. No. 493,477
Int. Cl.[2] B65H 75/18
U.S. Cl. 242—72.1 11 Claims

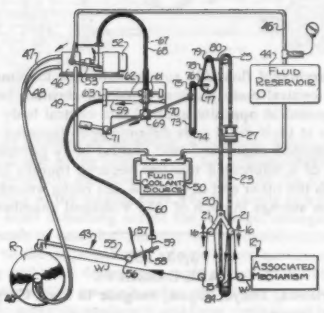


1. In a rotatable and expandable mandrel assembly including a mandrel including a plurality of longitudinally extending mandrel segments, a draw rod disposed within said mandrel, extending longitudinally thereof and fixed for rotation with said mandrel while movable longitudinally thereof, means for causing relative radial movement of said segments between expanded and collapsed mandrel configurations in response to longitudinal movement of said draw rod, and drive means mounted adjacent one end of said mandrel, the improvement comprising:
a. means for transmitting drive from said drive means to said mandrel to cause rotation thereof,
b. actuating means for causing longitudinal movement of said draw rod, and
c. means for selectively coupling said drive means to said drive transmitting means for rotation of said mandrel or to said actuating means to shift said draw rod longitudinally thereof and cause said segments to be shifted radially with respect to the longitudinal axis of said mandrel.

3,934,837
WEB WINDER AND COMPENSATOR APPARATUS

Hans O. Keilhack, and Peter Schmidt, both of Charlotte, N.C., assignors to Kelitex Corporation, Charlotte, N.C.

Filed Oct. 4, 1974, Ser. No. 512,361
Int. Cl.[2] B65H 59/00
U.S. Cl. 242—75.5 17 Claims



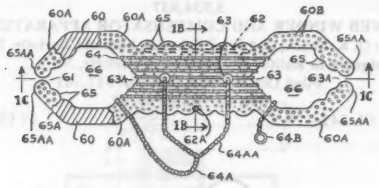
1. An improved web winder and compensator apparatus with automatic web winding speed compensating controls for selectively winding or unwinding at a uniform tension a roll of traveling continuous web material being selectively fed from or taken up by an associated mechanism, said apparatus comprising:
tension compensator means for receiving the traveling web in a predetermined path of travel therethrough and for compensating for variations in speed of travel of the web therethrough for maintaining a uniform tension therein during winding or unwinding thereof, said compensator means comprising stationary roll means positioned in the path of travel of the web for guiding the web through said compensator means, and counterbalanced movable roll means normally positioned on one side of said stationary roll means for receiving the traveling web therearound and moving toward and away from said stationary roll means for decreasing and increasing the length of the path of travel of the web through said compensator means in relation to the tension on the traveling web, said movable roll means including means for movement of said movable roll means to a threading position on the other side of said stationary roll means for straightline linear threading up of the web through said compensator means;
variable speed, center drive, reversible, winder means positioned adjacent said compensator means for selectively winding or unwinding a roll of the web material; and
control means including means for sensing the diameter of the web roll in said winder means, said control means being operatively connected between said compensator

means and said winder means for controlling the winding or unwinding speed of said winder means in relation to and in response to the speed of travel of the web through said compensator means as indicated by the position of said movable roll means of said compensator means and the diameter of the web roll as indicated by sensing means for maintaining a uniform tension in the web material being wound or unwound.

3,934,838
FLOATABLE TOW-LINE HOLDER

Paul M. D'Amico, 2709 S. 12th St., Philadelphia, Pa. 19148

Division of Ser. No. 828,072, May 1, 1969, Pat. No. 3,596,300.
This application June 14, 1971, Ser. No. 152,956
Int. Cl. B65h *75/36*
U.S. Cl. 242—85.1 **2 Claims**

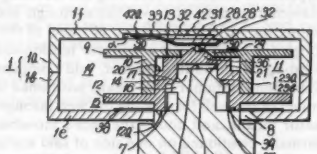


1. A laminated floatable substantially flat tow-line holder having a central body portion, a pair of clawlike bifurcated arms disposed at opposite ends of said central body portion, said arms at their distal ends defining open-throated substantially V-shaped chambers, said central body portion having one end of a bifurcated tow-line secured thereto forming a loop, with the other end of said tow-line being wound longitudinally for storage in each of said V-shaped chambers.

3,934,839
TAPE CASSETTE

Akio Serizawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 384,576, Aug. 1, 1973, abandoned. This application June 7, 1974, Ser. No. 477,482
Claims priority, application Japan, Aug. 11, 1972, 47-94388[U]
Int. Cl.² G03B *1/04*; **G11B** *15/32*, *23/04*
U.S. Cl. 242—198 **13 Claims**

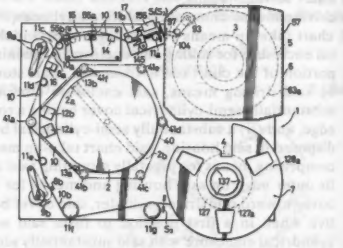


1. A tape cassette for use with a tape recording and/or reproducing apparatus having a rotatable reel drive means, said cassette comprising a casing including opposed walls and at least one tape-carrying reel rotatably contained in said casing between said walls, said casing having an aperture in one of said walls adapted for the insertion of the reel drive means therein, said reel including a hollow hub defining a socket having an opening at one end of said hub in registration with said aperture for the entry into said socket of the reel drive means inserted through said aperture, said socket being of stepped configuration to have a relatively large-diameter portion extending from said opening of the socket and a reduced-diameter cylindrical portion at the end of the socket remote from said opening for closely receiving a correspondingly dimensioned end portion of the reel drive means with a frusto-conical surface portion leading from said large-diameter portion to said reduced-diameter portion for directing the end portion of the reel drive means into said reduced-diameter portion of the socket, and at least one axially elongated rib projecting radially inward from the surface of said socket at said large-diameter portion of the latter and by which said reel is adapted to be rotatably coupled with the reel drive means.

3,934,840
REEL ASSEMBLY

Katsu Inaga, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 3, 1974, Ser. No. 476,091
Claims priority, application Japan, June 5, 1973, 48-66880[U]
Int. Cl.² G03B *1/04*; **G11B** *15/32*
U.S. Cl. 242—195 **4 Claims**



1. A reel assembly comprising a pair of tape-drawing wires with a required length, a connecting means for connecting said tape-drawing wires to another tape-like member, said connecting means being attached to one end of said tape-drawing wires, a reel hub, a pair of circular grooves formed on said reel hub to receive said tape-drawing wires wound thereon, a pair of flanges fixed to both ends of said reel hub and at least one cut-out portion formed on the circumference of said reel hub, said connecting means being led into said cutout portion when said tape-drawing wires are wound on said circular grooves and said tape-like member connected to said tape-drawing wires through said connecting means is wound around said reel hub, whereby said tape-like member can be orderly wound in circle around said reel hub.

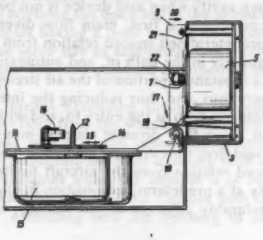
3,934,841
TAPE DRIVE

Edgar Zuckschwert, and Georg Friedrich Papst, both of St. Georgen, Germany, assignors to Papst-Motoren KG, St. Georgen, Germany

Filed Dec. 2, 1974, Ser. No. 528,648
Claims priority, application Germany, Dec. 11, 1973, 2361573
Int. Cl.² G03B *1/04*; **G11B** *15/32*, *23/04*
U.S. Cl. 242—198 **11 Claims**

1. A tape drive system for a recording and/or reproducing apparatus for a tape cassette having two tape spools one beside the other, comprising: a main housing; a movable casing portion connected to the main housing whereby a cassette-receiving space is provided between the main housing and the casing portion, the casing portion being displaceable relative to the main housing for exchanging a said cassette received in use in said space; tape winding motors for engaging the tape spools of a said cassette received in said space; at least one tape drive capstan; and at least one capstan drive motor driv-

ing the respective capstan to drive the tape, at least one of the motors being disposed in the casing portion for operatively engaging said received cassette from one side thereof, and the



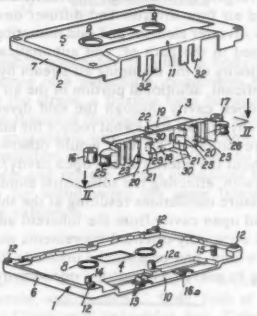
other motor or motors being disposed in the main housing for operatively engaging said received cassette from the other side thereof.

3,934,842

MINICASSETTE FOR RECORDING TAPE

Patrick Posso, 10, Avenue Jurigoz, Lausanne, Switzerland

Filed Sept. 12, 1973, Ser. No. 396,532
Claims priority, application France, Oct. 2, 1972, 72.34835
Int. Cl.[2] G03B *1/04*; G11B *15/32*, *23/04*
U.S. Cl. 242—199 7 Claims



1. In a minicassette for holding a recording tape, for use in a tape machine provided with a recording and/or playback head, the minicassette including a first member constituting a casing body having a base portion, a second member constituting a casing cover having a base portion and fitting on the first member with the base portions parallel, to define an enclosed space for holding a tape supply reel and a tape take-up reel, and means associated with the members for holding such reels in position, the improvement wherein:

said minicassette further comprises a third molded member formed independently of, and arranged to be disposed between, said first and second members and constituting a tape-guide for said minicassette, said third member comprising an elongated web portion and being of an anti-abrasive material having a low coefficient of friction relative to the recording tape and being provided with projecting portions defining a tape sliding surface absolutely perpendicular to the base portions of said first and second members, said projecting portions being in the form of tabs projecting from said web portion and each provided with a notch located at its center and defining part of said tape sliding surface; two of said tabs being located at a central region of said web portion and being spaced apart to define, with the part of said web portion disposed therebetween, a housing for holding a pressing member provided to cooperate with the tape machine head; and said two tabs being provided with lateral projections directed toward the region constituting said housing for engaging the pressing member to cause such member to be gripped between said part of said web portion and said lateral projections;

said first member is provided with projecting portions arranged to position said third member relative to said first member; and

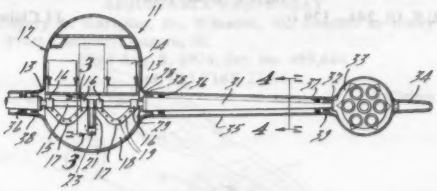
said members are dimensioned for causing said third member to be immobilized in position between said first and second members when said second member is fitted on said first member.

3,934,843

FREE WING FOR CONVERTIBLE AIRCRAFT STRUCTURE

John O. Black, 18094 Parkside, Detroit, Mich. 48221

Filed Aug. 5, 1974, Ser. No. 494,855
Int. Cl.[2] B64C *27/28*
U.S. Cl. 244—7 C 2 Claims



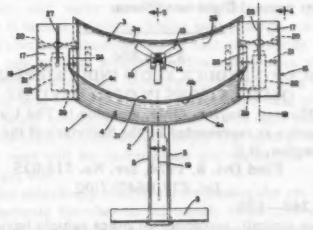
1. In an airplane construction, a fuselage, a spar extending from each side of the fuselage near the bottom thereof, a wing section pivotably mounted on each spar with the weight preponderance at the trailing edge which extends downwardly, a straight shaft extending across the fuselage, enlarged flanges on the ends of said shaft, means for removably securing said flanges to the adjacent ends of said spars, power means for rotating said shaft through an angle of approximately 90°, an engine supported on each outer end of the spars which are turned to move the engines to and from vertical and horizontal position, propeller means supported on the driving shaft of said engines for rotation thereby, and thrust bearings provided at each end of the wing sections adjacent to said fuselage and said engines.

3,934,844

FREE VORTEX AIRCRAFT

Ray R. Reighart II, 4778 Hillcrest North, Hilliard, Ohio 43026

Filed June 10, 1975, Ser. No. 585,708
Int. Cl.[2] B64C *23/06*
U.S. Cl. 244—40 A 26 Claims



1. Free vortex aircraft construction including a frame means;

b shield means mounted on the frame means to generate and shed a substantial amount of vorticity into the air when the aircraft moves forwardly through the air;

c the shield means and frame means providing a vortex forming zone downwind of the shield means;

d a plurality of engine means mounted on the frame means to provide thrust for moving the aircraft forwardly through the air, and for pumping air from spaced locations in the vortex forming zone to retain and concentrate the vorticity within said zone to form a free vortex of low pressure air extending in an arcuate manner across the frame means; and

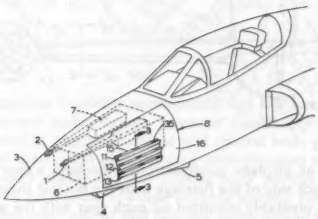
e surface means on the frame means located beneath at least a portion of the spaced pumping locations, on which the free vortex acts to produce lift on said aircraft.

3,934,845

GUN BAY PRESSURE RELIEF DEVICE

Alexander Rosin, Torrance, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Mar. 17, 1975, Ser. No. 559,147
Int. Cl.² B64C 1/14
U.S. Cl. 244—129 D **11 Claims**



1. In combination with an aircraft having a gun bay and gun bay door in the side thereof; pressure relief means comprising:

a. means defining a cutout in said gun bay door;

b. a continuous hinge having an upper and a lower section hinged together by a continuous hinge pin;

c. said lower section being fixed to said gun bay door in the lower portion of said cutout and forming a flush outer surface with said gun bay door;

d. said upper section dimensioned to cover the upper portion of said cutout when in a closed position and rotatable outwardly and downwardly to an open position during internal pressure buildup within said gun bay due to gun gas explosion;

e. said upper section being automatically moved toward said closed position by normal in-flight upward flow of air around said gun bay door, as said pressure subsides; and

f. holding means to maintain said upper section in said closed position flush with the outer surface of said door under normal flight conditions.

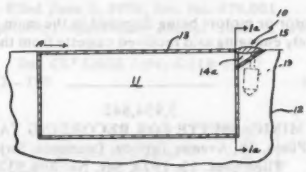
3,934,846

DEVICE TO REDUCE FLOW INDUCED PRESSURE OSCILLATIONS IN OPEN CAVITIES

Otto F. Maurer, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 8, 1974, Ser. No. 513,025
Int. Cl.² B64C 7/00
U.S. Cl. 244—130 **13 Claims**

1. In an aircraft, aerospace or other vehicle having a bomb bay or other cavity for containing weapons or other stores, and door or other enclosure means openable during vehicular operation to expose the open cavity to the relatively fast moving air stream; a combined air flow deflector and diffuser device for reducing excessive pressure oscillations being otherwise induced in and near the open cavity by the inherent unsteady nature of the relatively fast moving air stream flow past the said cavity, as is manifested by the normal considerable inward and outward movement of the said flow relative to the said open cavity when said device is not being utilized, said device comprising; a first, main flow diverter element located in a predetermined spaced relation from the body of said vehicle directly in the path of, and automatically operative to divert a substantial portion of the air stream away from its normal entry into, and thus reducing the intensity of the pressure oscillations both at the entry to, and within the open cavity; second, main flow diverter element-mounting means for attaching said first, flow diverter element in the said predetermined spaced relation from the aircraft fuselage or other vehicular body at a predetermined position in alignment with a location preferably adjacent or substantially adjacent the



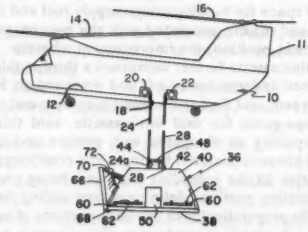
trailing edge of the open cavity; and third, flow diffuser means comprising divergent slotted means inherently incorporated in said combined air flow diverter and diffuser device between said first, flow diverter element and said mounting means, and further disposed in the path of, and automatically acting to reduce the velocity of the incoming air stream by the diffused flow of a significant, additional portion of the air stream flowing past the open cavity through the said divergent slotted means to thereby further somewhat reduce the inherent turbulence and circulation of air that would otherwise normally occur throughout the interior of the open cavity, and, simultaneously therewith, effecting the substantial elimination of the excessive pressure oscillations resulting at the shield area and within the said open cavity from the inherent and substantial inwardly and outwardly-oriented movements normally tending to occur within, and causing the unsteady flow of the air stream during its movement past the open cavity.

3,934,847

RESCUE CAPSULE FOR USE WITH A HELICOPTER

Pasquale P. Bentivegna, 56 Gladstone St., East Boston, Mass. 02128

Filed Oct. 4, 1974, Ser. No. 511,734
Int. Cl.² B64C 1/22
U.S. Cl. 244—137 P **7 Claims**



1. A rescue capsule in combination with a helicopter, said capsule comprising;

a floor,

a top,

a continuous side extending between the floor and top,

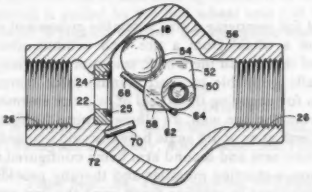
at least one door in the side to provide access to the capsule,

said top having an opening therethrough,
a projecting member extending above the top having a continuous side enclosing the opening and defining a passageway leading from the opening,
a cover for covering the open top of the projecting member,
said helicopter having a floor having an opening therein of about the same size as said projecting member,
winch means disposed adjacent the opening in the helicopter floor,
and cable means extending through the opening in the helicopter floor from the winch means to the capsule top,
wherein said winch means raises and lowers the capsule with the projecting member defining both a passageway to the helicopter when the capsule is at its top position and a guide for aligning the capsule with the projecting member extending into the opening in the helicopter floor.

3,934,848
RISER RELEASE BUCKLE DEVICE
Stephen L. Snyder, 331 Cherry Hill Blvd., Cherry Hill, N.J. 08034
Filed Dec. 31, 1974, Ser. No. 537,660
Int. Cl.² B64D *17/32*
U.S. Cl. 244—151 A 13 Claims

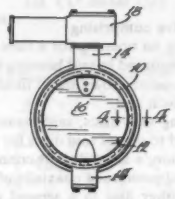
1. A releasable connector coupling a body harness strap with a riser strap of a parachute, comprising buckle means connected to the straps, a flexible loop connected to one of the straps and threaded through the buckle means, a locking pin assembly engageable with the threaded loop extension for preventing separation of the riser strap from the buckle means and the harness and release means connected to the locking pin assembly for withdrawing the same laterally from the threaded loop extension.

3,934,849
SEATING AND ACTUATOR FOR A BALL VALVE
Eldon W. Morain, and Judson C. Cole, both of Tulsa, Okla., assignors to Continental Industries, Inc., Tulsa, Okla.
Filed June 14, 1974, Ser. No. 479,283
Int. Cl.² F16K *25/00*
U.S. Cl. 251—163 7 Claims



1. A valve comprising:
a valve body having a flow passageway therethrough;
an annular valve seat interposed in said passageway and having an aperture therethrough which defines a portion of said fluid passageway;
an operator shaft opening in one side of the valve body;
a ball in said passageway adaptable to close the valve when moved against the valve seat;
actuating arm means sealably journalled through said shaft opening and having a shaft portion disposed interior of the valve body, the actuating arm having a pair of spaced transverse apertures therein internally of said valve body;
a cam arm carried by the said shaft and extending outwardly therefrom for engaging and moving said ball toward the valve seat;
a retaining pin secured to the interior of the valve body adjacent to the valve seat for encountering and deflecting the said ball toward the valve seat;
a cam surface provided on said cam arm for forcing said ball against the valve seat when the actuating arm means is pivoted to a valve-closed position; and
a U-shaped bar having parallel finger portions received in said pair of apertures in said actuating arm, the finger being angularly spaced from the cam arm, said fingers being adaptable for engaging the ball and moving said ball out of contact with the valve seat and carrying said ball out of the direct flow path when the actuator arm is pivoted to the valve-open position.

3,934,850
ADJUSTABLE VALVE SEAT
Gregory A. Kurkjian, Jr., Wheaton, Ill., assignor to Henry Pratt Company, Aurora, Ill.
Filed Aug. 8, 1974, Ser. No. 495,644
Int. Cl.² F16K *25/00*
U.S. Cl. 251—171 5 Claims

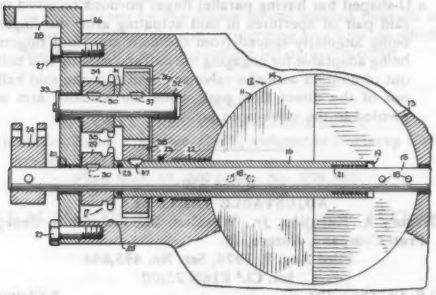


1. A valve having an adjustable valve seat comprising:
a valve body having an interior passage through which fluid may flow;
a valve member journalled in said body for movement between positions opening and closing said passage;
a peripheral, inwardly opening groove having opposed side walls in said body fronting on said passage and aligned with said valve member when said valve member is in a position closing said passage;
a valve seat of flexible material and having opposed sides disposed within said groove and adapted to sealingly contact said valve member about its entire periphery when it is in a position closing said passage, one side of said valve seat abutting one of said groove side walls;
at least one arcuate member within said groove about the periphery thereof and having a surface engaging the other side of said valve seat, said surface and said other side wall being configured such that when said member is progressively moved more deeply into said groove, said valve seat will be compressed and deformed into said passage; and
means for selectively effectively increasing the arc length of said arcuate member to selectively cause said compression and deformation, said increasing means comprising a turnbuckle;
there being plural said arcuate members and a substantially equal number of said turnbuckles, said turnbuckles being disposed between adjacent ends of said members within said groove.

3,934,851
BUTTERFLY VALVE HAVING A SPLIT VANE

Henry Illing, Parksville, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,084
Int. Cl.² F16K 31/53
U.S. Cl. 251—248 13 Claims



1. A butterfly valve comprising
a housing defining an opening for a flow of fluid;
a butterfly vane mounted in said housing to selectively open and close said opening to a flow of fluid, said vane including a pair of discs; and
means for pivoting said discs, said means including a first shaft connected to one of said discs for pivoting said discs in a first direction, a second shaft connected to the other of said discs and positioned coaxially of said first shaft for pivoting said other disc in a second direction opposite said first direction, and a transmission connected to said shafts to rotate said shafts simultaneously in opposite directions to move said discs between respective closed positions and open positions thereof.

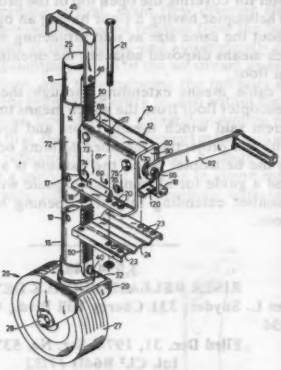
8. A butterfly valve comprising
a butterfly vane having a pair of semi-circular discs sequentially mounted on a common axis, said discs defining a line of separation therebetween when closed which is disposed at a right angle to said common axis, said axis passing transversely through each said disc; and
means for pivoting said discs in opposite directions to each other about said common axis from a closed position to an open position.

3,934,852
TRAILER TONGUE JACK

Bernard R. Weber, Elm Grove, and David W. Wendt, Monona, both of Wis., assignors to Wesbar Corporation, West Bend, Wis.

Filed Aug. 11, 1975, Ser. No. 603,435
Int. Cl.² B60S 9/02; B66F 3/16
U.S. Cl. 254—86 R 9 Claims

1. In a jack: an elongated post having a rack along a side thereof; a housing through which said post member extends; a member pivotally mounted on said housing and selectively movable between two positions; a gear rotatably mounted on said member, said gear being in meshed engagement with said rack on said post when said member is in one of said two positions and said gear being out of meshed engagement with said rack on said post when said member is in the other of said two positions; and means mounted on said member for selectively rotating said gear in opposite directions to move said

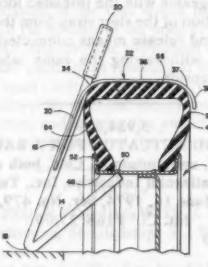


post axially with respect to said housing when said member is in said one position and said gear and rack are engaged.

3,934,853
TIRE RETRIEVAL TOOL

William Orsburn, 1599 N. Norma St., Sp. 24, Ridgecrest, Calif. 93555

Filed Dec. 17, 1973, Ser. No. 425,139
Int. Cl.² B66F 3/00
U.S. Cl. 254—131 2 Claims



1. A tool for removing a tire assembly comprised of a tire mounted on a wheel from a tire well without altering the mounting of the tire on the wheel, said tool comprising a first arm manually grippable to exert manual force thereupon, a second arm for engaging the wheel of said tire assembly to be removed from the tire well, an elbow joining the first arm to the second arm at an acute angle between said first and second arms, said first arm and second arm being configured to operate as a torque-exerting member and thereby provide a mechanical advantage in exerting force upon the first arm, a tire engaging brace fixedly attached to said first arm at a point of attachment intermediate the elbow and a free end of said first arm, said brace being configured as a somewhat U-shaped member including a first segment for contacting and engaging a first sidewall of the tire, a second segment for contacting and engaging the tread of the tire, and a third segment for contacting the opposite sidewall of the tire, to thereby restrain motion otherwise tending to disengage said tire assembly from the torque-exerting member when the second arm engages the tire in a torque-exerting relationship, said third segment being substantially equal to 2 inches in length, said third segment

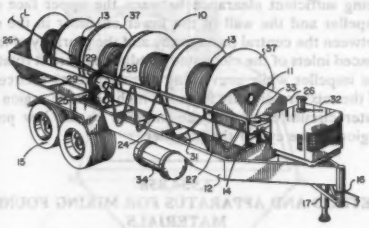
being joined to the second segment at substantially an angle of 130°, said first segment being substantially seven inches in length, said first segment also being joined to said second segment at substantially an angle of about 120° and said second segment having a length of substantially about 6½ inches.

3,934,854

APPARATUS FOR WINDING PILOT LINES

Robert W. Goode, Arlington, Tex., assignor to Hydra Dyne Corporation, Forth Worth, Tex.

Filed July 17, 1974, Ser. No. 489,397
Int. Cl.² F21C *29/16*
U.S. Cl. 254—134.3 R **6 Claims**



1. A portable reeling apparatus for winding elongated material upon a plurality of take-up elements mounted in side by side relationship, each element being rotatable about a horizontal axis in a substantially vertical plane parallel to the planes of rotation of the other elements, comprising:

a base for supporting the take-up elements;

means for rotating said take-up elements;

elongated guide means mounted on said base spaced from and parallel to the axis of each of said elements;

a bull wheel unit for receiving and advancing the elongated material toward a selected one of the take-up elements;

means for slidably mounting said bull wheel unit for rectilinear movement on said guide means; and

drive means operable to position said bull wheel unit at desired positions along said guide means and to produce reciprocating movement of the bull wheel unit along the guide means relative to any selected one of said take-up elements for level winding the elongated material onto the selected one of said take-up elements as the elongated material is pulled by the bull wheel unit and the take-up element is rotated to store the elongated material.

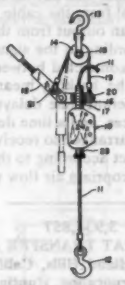
3,934,855

WIRE ROPE BINDER

William W. Patterson, III, and Eugene F. Grapes, both of c/o W. W. Patterson Company, 830 Brocket St., Pittsburgh, Pa. 15233

Filed Sept. 24, 1973, Ser. No. 399,826
Int. Cl.² B66D *1/00*
U.S. Cl. 254—135 R **6 Claims**

1. A cable fastening apparatus comprising a cable of given length, a clamp means adjustably positioned on said cable intermediate its ends, fastening means on one end of said cable spaced from said clamp means, said clamp engaging the cable on movement of the cable in the direction of said one end and releasing the rope on movement of the cable in the opposite direction, a base member on the side of the clamp opposite said fastening means, and anchoring means on the clamp coaxial with the cable and on the end opposite said one end of said cable, said anchoring means rigidly securing said clamp to said base member during normal operation, said base member further being adjustably secured to said anchoring



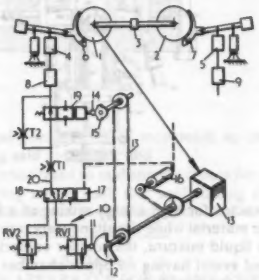
means to permit the distance between the base member and the clamp to be varied in discrete increments.

3,934,856

MINE HOISTS

Bernard Elliott Shaw, Paisley, Scotland, assignor to Fullerton, Hodgart & Barclay Ltd., Paisley, Scotland

Filed June 14, 1974, Ser. No. 479,505
Claims priority, application United Kingdom, June 14, 1973, 28418/73
Int. Cl.² B66D *1/26*
U.S. Cl. 254—184 **7 Claims**



1. In a mine winder of the type having two load-carrying cables wound in opposite directions around respective drums incorporating for each cable and its associated cable-supporting drum a braking mechanism, said braking mechanism comprising motion-sensitive means for sensing the immediate operating conditions of the cable, said motion-sensitive means incorporating one element the position of which is variable according to the amount of cable paid out from the drum and a second element arranged to occupy one of two possible extreme positions, one of which corresponds with most of the cable paid out or most of the cable reeled in and the other of which corresponds with positions of the cable between these extreme positions, the positions of these two elements constituting mechanical signals, and a cable movement detector arranged to sense whether the cable is moving above or below a predetermined minimum speed and if it is moving above said minimum speed in which direction and to generate a corresponding signal, pressure operated braking means for controlling the rate of movement of the cable, brake control means including air pressure control means operative to provide at least two separate supplies of air at different pressures and means for varying the pressure of the supply at the higher pressure between a minimum and a maximum value, said last mentioned means being arranged to receive a signal from said

one element and to act according to the signal received to vary the air supply pressure, a changeover valve connected to the air pressure control means and having operating means arranged to receive a signal from the cable movement detector and thereupon connect an output from the valve to either of said supplies of air according to the signal received, two air flow restricting devices connected between the outlet of the changeover valve and the braking means and arranged to provide individually different time delays in the build-up of pressure across the devices, and a time delay selecting device having operating means arranged to receive a signal from said second element and to act according to the signal received to render effective the appropriate air flow restricting device.

3,934,857

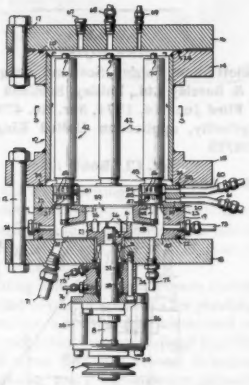
MIXING AND HEAT TRANSFER APPARATUS

Douglas W. Hege, Woodland Hills, Calif., assignor to Hege Advanced Systems Corporation, Huntington Beach, Calif.

Filed Nov. 16, 1973, Ser. No. 416,520

Int. Cl.² B01F *5/16, 15/06*

U.S. Cl. 259—8 **10 Claims**



7. A reactor for high energy mixing of a liquid and at least one other material while simultaneously transferring heat to or from the liquid mixture, the reactor comprising:

a closed vessel having an upper chamber, means for introducing the materials to

be mixed into the upper chamber, a lower chamber,

a short passageway, centrally located within the vessel, leading from the upper chamber to the lower chamber for conducting the materials to be mixed from the upper chamber into the lower chamber,

a plurality of elongated thin-walled conduits leading from inlets in the lower chamber that are radially spaced from the central passageway to outlets in the upper chamber for returning the mixture of materials to the upper chamber, each elongated conduit comprising

a first inner portion of annular cross section having a thin outer wall,

a second outer portion of annular cross section having a thin inner wall, the second portion coaxially surrounding the first portion with the thin inner wall of the second portion being spaced radially from the thin outer wall of the first portion; the passages for the heat exchanging fluid extending between the thin outer wall of the first portion and the thin inner wall of the second portion, and

a plurality of elongated passages extending along the length of each of the elongated conduits in circumferentially spaced relation on the other side of the thin wall from the flowing mixture of materials for conducting a heat exchanging fluid having a temperature different from the temperature of the mixture of materials flowing through the conduits, whereby heat transfer occurs between the heat exchanging fluid and the liquid flowing through the first portion across the thin outer wall of the first portion and between the heat exchanging fluid and the liquid mixture flowing through the second portion across the thin inner wall of the second portion;

a centrifugal impeller mounted in the lower chamber for rotation about an axis coincident with the axis of the central passageway, the impeller having a plurality of blades extending outward from an open eye at the center of the impeller to the outer circumference of the impeller; and

drive means for rotating the impeller about its axis, whereby the materials to be mixed are drawn from the upper chamber through the central passageway into the eye of the impeller, then are impelled outward between the rotating blades which impart kinetic energy to the mixture as it flows through the impeller, and finally are returned through the plurality of elongated conduits to the upper chamber, there being sufficient clearance between the upper face of the impeller and the wall of the lower chamber in the region between the central passageway and the plurality of radially spaced inlets of the elongated conduits to permit rotation of the impeller while preventing any significant recirculation of the mixture directly from the high pressure region at the outer circumference of the impeller to the low pressure region at the eye of the impeller.

3,934,858

METHOD AND APPARATUS FOR MIXING FOUNDRY MATERIALS

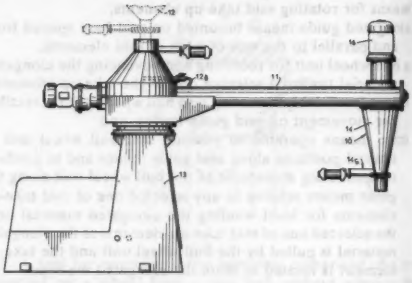
Raymond Arthur Parsonage, West Bromwich, and Harold Higgs, Wolverhampton, both of England, assignors to Fordath, Limited, West Bromwich, England

Filed Dec. 17, 1973, Ser. No. 425,231

Claims priority, application United Kingdom, Apr. 24, 1973, 19442/73

Int. Cl.² B01F *7/24*

U.S. Cl. 259—8 **6 Claims**



1. Apparatus for producing a foundry mixture of sand and a rapid setting binder comprising:

means defining a discharge chamber having a foundry mixture discharge aperture at its lower end for discharging said foundry mixture;

means for separately introducing into the upper end of said chamber a sand/binder mixture and a sand/catalyst mixture;

a rotatable shaft extending downwardly and centrally through said chamber;

means for rotating said shaft;

a plurality of deflector blades fixed to said shaft, each such deflector blade being so shaped and positioned as to deflect downwardly flowing materials in an upward direction;

and a plurality of mixer blades fixed on said shaft and shaped and positioned to propel said downwardly flowing materials toward the discharge aperture;

said deflector blades and said mixer blades being arranged in groups comprising at least two mixer blades angularly spaced apart and at least one of said deflector blades;

each said deflector blade in each of said groups being positioned below and angularly between the mixer blades in each said group.

3,934,859

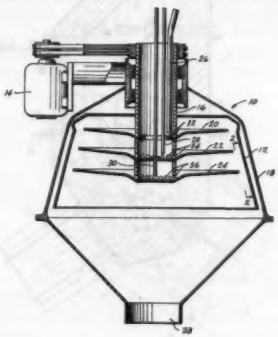
MIXING APPARATUS

Vagn Deve, East Washington, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 412,233, Nov. 2, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 464,020

Int. Cl.² B01F 7/10

U.S. Cl. 259—8 **6 Claims**



2. Apparatus for mixing two materials, including an upright vertical housing having a circular cross section, a central shaft positioned within the housing, a first disc secured to the shaft, a second disc secured to the shaft below the first disc, means for rotating the housing and shaft, means for introducing a first material onto the upper surface of the first disc, means for introducing a second material onto the upper surface of the second disc, the inner surface of the housing having a plurality of diamond-shaped protrusions thereon, and outlet means in the lower portion of the housing through which the mixed material can be discharged.

3,934,860

APPARATUS FOR THE TREATMENT OF MEAT PRODUCTS

Paul W. Michels, Plasmolen-Mook, and Ben G. Langen, Oeffelt, both of Netherlands, assignors to Homburg B.V., Cuyk, Netherlands

Filed Apr. 13, 1973, Ser. No. 350,746

Claims priority, application Netherlands, Apr. 13, 1972, 7204990

Int. Cl.² B01F 7/16

U.S. Cl. 259—108 **2 Claims**

1. Apparatus for the treatment of meat products, comprising:

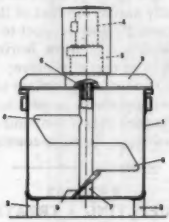
a rectangular container with rounded edges;

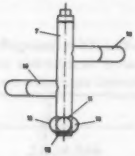
stirring means for subjecting all of the meat chunks retained in said container to a stirring movement, said stirring means comprising:

a stirring shaft,

a plurality of stirring blades affixed to said stirring shaft at angular spacings thereabout and at different levels thereon, each of said blades comprising a body which is symmetrical relative to its longitudinal axis and has flat upper and lower surfaces and rounded side walls, said rounded side walls causing horizontal and vertical components of movement of the meat chunks, the horizontal width of the blade perpendicular to its longitudinal axis first increasing, starting from the shaft up to a maximum substantially at half the radial blade length and thereafter decreasing again, and

drive means connected to said stirring shaft for supplying sufficient power to said shaft to impart said horizontal





and vertical components of movement to chunks of meat filling said container; and

support means connected to said stirring means for supporting said stirring means such that said stirring shaft and said stirring blades are suspended within said container.

3,934,861

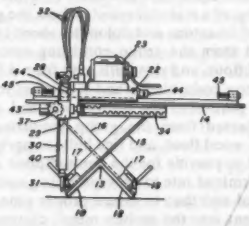
METHOD AND APPARATUS FOR FLAME-CUTTING ANGLE IRONS

George A. Rahall, Bellevue Borough, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 9, 1975, Ser. No. 539,668

Int. Cl.² B23K 7/10

U.S. Cl. 266—23 R **8 Claims**



1. An apparatus for flame-cutting segments from an angle iron workpiece which has two legs and a corner where the legs intersect and is positioned with the corner facing upwardly, said apparatus comprising:

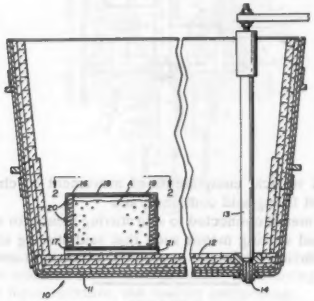
a frame adapted to be positioned over the workpiece;
a carriage mounted on said frame for horizontal movement therealong;
a torch mounted on said carriage for vertical movement with respect thereto and having a cutting tip at its lower end;
drive means on said carriage for moving said carriage and said torch horizontally across the workpiece; and
pinion means on said carriage operatively connected with said frame and said torch for moving said torch upwardly with respect to said carriage while said carriage and torch move horizontally across the first of the legs of the workpiece and downwardly with respect to said carriage while said carriage and torch move horizontally across the second of the legs of the workpiece;
said pinion means constraining said tip to move in a straight line at a constant angle with respect to the workpiece and at a constant distance therefrom, and at a constant speed as long as the carriage speed is constant.

3,934,862

DEVICE FOR SUPPLYING A TREATING AGENT TO MOLTEN METAL IN A LADLE

Micheal Donald LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 347,556, April 12, 1973, abandoned. This application June 13, 1974, Ser. No. 480,141
Int. Cl.² C21C 7/00
U.S. Cl. 266—34 T **5 Claims**



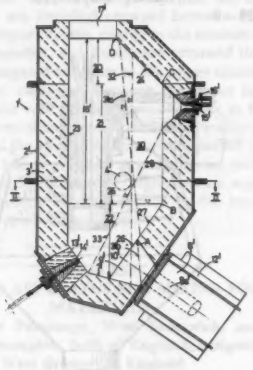
1. A refractory lined apertured ladle for making additions to molten metal, said ladle including a refractory lined apertured bottom and an upstanding, refractory lined side wall peripherally of the bottom, means closing the aperture in the bottom, and a hollow, heat consumable-disintegratable container supported in the ladle and having an addition agent confined therewithin, said container comprising a body having top and bottom open ends and made of a mixture comprising about 132 lbs. of a material selected from the group consisting essentially of limestone and dolomite, about 16 lbs. of a material selected from the group consisting essentially of wood chips, wood flour, and rice hulls, and from 4 lbs. to 10 lbs. of a hydrocarbon resin binder and a catalyst for the binder, a preselected portion of the resin binder and catalyst and the material selected from the group consisting essentially of wood chips, wood flour, and rice hulls comprising a combustible material to provide for the consumption of the container at a predetermined rate to prevent boiling and agitation of the molten metal and thus to insure proper timed release of the addition agent into the molten metal, closure means closing the top and bottom ends of the body, and spacer means on the bottom of the container supporting the container in the ladle in predetermined spaced relation from the bottom of the ladle for proper positioning of the addition agent in the molten metal in the ladle, said spacer means having a weight sufficient to hold the container submerged in the molten metal and defining means for freezing of the container to the ladle bottom.

3,934,863

APPARATUS FOR REFINING MOLTEN METAL AND MOLTEN METAL REFINING PROCESS

Lars-Gunnar Norberg, Hagfors, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Mar. 11, 1974, Ser. No. 450,232
Int. Cl.² C21C 5/46
U.S. Cl. 266—35 **11 Claims**



1. Apparatus for treating a molten metal with a gas/solid suspension or other fluid comprising a refractory lined converter for holding the molten metal, the converter being tiltable about a horizontal axle bar and having:
(1) A front-wall, a back wall and a sloping bottom defining a lower converting zone, the front wall and back wall being on opposite sides of a plane containing the axle bar which is a vertical plane when the converter is in its vertical operating position, the bottom being inclined at an oblique angle to the front wall so that the lower zone tapers towards the point which is the deepest point in the converter when the converter is in its vertical operating position,
(2) A top section, on top of the walls, including a charging port and having a sloping top wall inclined at an oblique angle to the front wall so that the top section tapers towards the charging port,
(3) At least one heating zone spaced away from the converter, the heating zone having at least one channel in liquid communication with the lower zone, the channel opening into the lower zone at a level that will be below the surface of the molten metal when the converter is in its vertical operating position and essentially in the region of that point in the converter which is the deepest point when the converter is in its vertical operating position and means for heating the contents of the zone by electric induction heating to an extent such that a temperature gradient can be established between the contents of the heating zone and the contents of the lower converting zone,
(4) At least one tuyere for introducing the gas/solid suspension or other fluid, said tuyere opening into the lower converting zone through the bottom or the back wall at a level that will be below the surface of the molten metal when the converter is in its vertical operating position, said tuyere and said heating zone channel being located on the opposite sides of the plane containing the axle bar which is a vertical plane when the converter is in its vertical operating position,

(5) A tap-hole in the front wall,

the converter being dimensioned such that when the converter is in a substantially horizontal tapping position, the volume of the basin bounded by the sloping top wall, the front wall and the sloping bottom is at least equal to the volume of the lower converting zone.

3,934,864

PROCESS AND INSTALLATION FOR REDUCTIVE MELTING OF IRON SCRAP, POWDER OR SPONGE

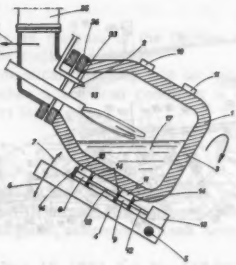
Jean Georges Marie Morlet, Paris, France, assignor to Creusot-Loire, Paris, France

Division of Ser. No. 885,623, Dec. 16, 1969, abandoned, which is a continuation-in-part of Ser. No. 693,995, Dec. 27, 1967, abandoned. This application Dec. 14, 1971, Ser. No. 208,013

Claims priority, application France, Jan. 13, 1967, 67.90994

Int. Cl. C21c *5/32*

U.S. Cl. 266—36 H **5 Claims**



1. A reductive melting installation comprising a converter rotatable about its axis and carried by a tiltable cradle, an opening for said converter, a burner adjacent said opening supplied with fuel directed towards the interior base of said converter, an axial channel in said burner supplying a mixture of fuel and oxygen and at least two injectors adjacent the periphery of said burner for industrially pure oxygen discharging the industrially pure oxygen in front of the base of the burner flame.

3,934,865

UNDERWATER TIMER AND RELEASE DEVICE

Edwin J. Wedrall, 1170 N. Puente St., Brea, Calif. 92611

Division of Ser. No. 421,856, Dec. 5, 1973. This application Sept. 9, 1974, Ser. No. 504,338

Int. Cl.[3] F16F *5/00*

U.S. Cl. 267—114 **1 Claim**

1. A fluid controlled timing device, comprising:

a cylindrical housing having an upper wall and a removable lower end wall, wherein there is defined a compartment:

a slidable piston head disposed within said compartment;

a primary chamber formed between said upper wall and said piston head;

a secondary chamber formed between said lower end wall and said piston head;

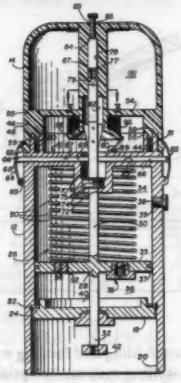
a biasing means disposed within said primary chamber, whereby said piston head is biased in the direction of said secondary chamber;

a one-way check valve positioned within said piston head, whereby fluid is allowed to pass from the primary chamber into said secondary chamber;

a fluid-flow-regulating means disposed in said piston, whereby fluid flow from said secondary chamber to said primary chamber is metered therethrough at a predetermined rate for controlled movement of said piston;

wherein said fluid-flow-regulating means comprises a plug disposed in said piston head having a orifice extending therethrough, providing a communicating passage between said primary and secondary chambers, whereby said flow of fluid is predetermined by the size of said passage;

at least one rod attached to said piston head and extending outwardly from said housing; and



a hydraulic fluid is disposed within said cylindrical housing, and wherein said cylindrical housing includes a plug removably received within an opening positioned in said housing.

3,934,866

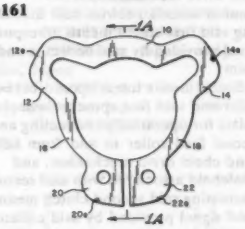
SPECIAL-PURPOSE SPRING RETAINING RINGS

Omar Platti, New York, and Wally Berliner, Floral Park, both of N.Y., assignors to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed Oct. 8, 1974, Ser. No. 513,060

Int. Cl.[3] F16F *1/34*

U.S. Cl. 267—161 **6 Claims**



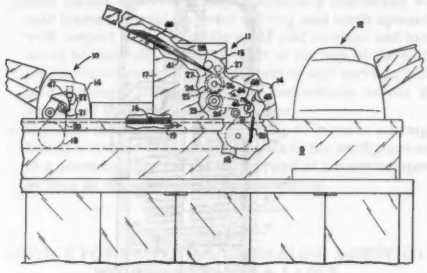
1. A special-purpose spring ring adapted to be sprung into groove provided therefor in a shaft, post, housing bore surface and the like and to function as an artificial shoulder thereon comprising: an open-ended uni-planar ring body provided by circumferentially spaced-apart middle and sidewardly disposed arcuate length-portions having section heights which decrease progressively from the mid-section of said middle arcuate length-portion to the open ends of the ring body which define the ring gap, an upright queen-truss formation interposed between and connecting ends of the opposite ends of said middle arcuate length-portion to the adjacently disposed end of a sidewardly disposed arcuate length-portion, the outer edges of the beams of said truss formations extending along arcs of a circle struck from the ring-body center, the open ends of the ring body having radially outwardly extending end-formations, the outer edges of which are generally arcuate and lie on the same circle as that of the outer edges of the beams of said truss formations.

3,934,867

COLLATING, FOLDING AND INSERTING SYSTEM

Frank A. Oeschger, Jr., East Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 3, 1974, Ser. No. 475,435
Int. Cl.² B41L 43/00
U.S. Cl. 270—32 9 Claims



7. A document folding and feeding mechanism for a collator and envelope stuffing system, comprising:

a tray carried by a folding and feeding mechanism for supporting a quantity of documents to be folded;

a first feed roller supported by said tray for feeding said documents into said folding and feeding mechanism;

a main drive means operatively supported by said collator and envelope stuffing system;

a first sprocket wheel and chain drive mechanism operatively connected to said main drive means;

a second sprocket wheel and chain drive mechanism operatively connected to said first sprocket wheel and chain drive mechanism;

a first clutch means interposed between said first feed roller and said second sprocket wheel and chain drive mechanism for operatively connecting and disconnecting said frist feed roller to and from said second sprocket wheel and chain drive mechanism;

a first solenoid associated with said first clutch means for actuating said first clutch means in response to a demand feed signal provided by said collector and envelope stuffing system;

a second clutch means interdisposed between said second feed roller and said first sprocket wheel and chain drive mechanism for operatively connecting and disconnecting said second feed roller to and from said first sprocket wheel and chain drive mechanism; and

a second solenoid associated with said second clutch means for de-actuating said second clutch means in response to a demand signal provided by said collator and envelope stuffing system.

3,934,868

TOP LOADING, CONTINUOUS SUCTION FEEDER ATTACHMENT FOR PRINTING APPARATUS

Martin Selak, Des Plaines, Ill., assignor to Astro Engineering Corporation, Skokie, Ill.

Filed Dec. 7, 1973, Ser. No. 422,877
Int. Cl.² B65H 1/28, 3/08, 9/06, 9/10
U.S. Cl. 271—9 11 Claims

1. A top loading, sheet feeding attachment adapted to be coupled to and actuated by the drive means of a utilization device such as a multi-lith offset machine or the like that is capable of a first, normal mode of operation, said attachment being adapted to be left in place on the utilization device when said attachment is not being used without interfering with the first mode of operation of the utilization device, said attachment comprising, in combination:

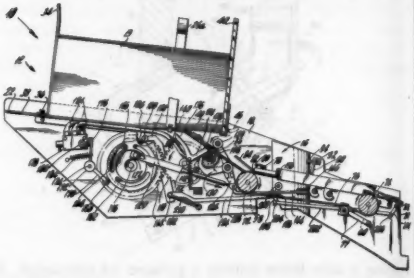
a. a loading section for accepting at least one stack of the sheets to be fed to the utilization device;

b. a transfer section positioned downstream of and contiguously with said loading section, said transfer section including suction means for pulling downwardly the bottom sheet in the stack on said loading section and at least one pair of roller means for receiving the pulled-down sheet therebetween and for advancing the pulled-down sheet in a direction away from said suction means and away from said loading section;

c. conveyor means for receiving the pulled-down sheet from said roller means and for transporting the pulled-down sheet towards the utilization device;

d. aligning means for orienting the sheet on said conveyor means relative to the input of the utilization device, said aligning means including a first, longitudinally extending rail positioned parallel to one longitudinal edge of said belt and a second, laterally adjustable rail parallel to said first rail; and

e. a transmission system including a drive train coupled to said conveyor means and adapted to be coupled to the



drive means of the utilization device, said transmission system further comprising:

1. first actuating means for moving said suction means towards and into engagement with the bottom sheet in the stack and then in a direction away from the bottom of the stack and for moving at least one of said pair of roller means into and out of frictional driving engagement with the sheet therebetween;

2. first timing means for controlling the application of a vacuum to said suction means with respect to the movement of said first actuating means; and

3. second actuating means for operating said aligning means in timed relationship to the movement of said suction means and to the application of vacuum thereto, said second actuating means comprising a reciprocating crank arm driven by a portion of said transmission system, a cam driven by said crank arm in a direction substantially parallel to said second rail and a cam follower positioned so as to be engaged by said cam, said cam follower being secured to said second rail and limited to movement that is perpendicular to the length thereof.

3,934,869

SHEET SEPARATING AND FEEDING APPARATUS

Erwin J. Strobel, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1973, Ser. No. 426,976
Int. Cl.² B65H 3/04
U.S. Cl. 271—35 8 Claims

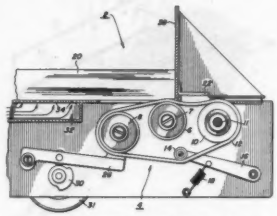
1. An apparatus for feeding and separating individual sheets from a stack of sheets including:

a first feed roll mounted on a stationary axis adjacent the forward edge of the stack for separating sheets from the stack under normal operating conditions;

a second feed roll mounted on a second axis adjacent said first feed roll, said second axis being movable toward and

away from the stack to move said second feed roll toward and away from the stack;

friction surface means associated with said first roll and said second roll, movement of said second roll toward the



stack causing an increase in the friction surface area contacting the stack; and,

means for automatically moving said second roll toward said stack when a non-feed condition is encountered during a sheet feed cycle.

3,934,870

SHEET FEEDING DEVICES

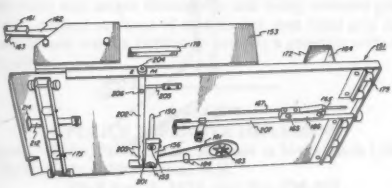
Laurence G. Miller, Drybrook, and Vernon J. Smith, Tewkesbury, both of England, assignors to Rank Xerox Ltd., London, England

Filed Nov. 19, 1973, Ser. No. 417,022

Claims priority, application United Kingdom, Dec. 1, 1972, 55724/72

Int. Cl.² B65H *1/04*

U.S. Cl. 271—164 **3 Claims**



1. A sheet feeding device comprising a frame, means defining a support surface for a stack of sheets, the surface being movably mounted in the frame so that the surface can be moved to either a feeding position for feeding sheets or to a loading position for loading sheets onto the surface, a first edge margin guide fixed to the surface, a second edge margin guide movably mounted on the surface so that the second edge margin guide can be moved in a direction perpendicular to the first edge margin guide while the surface is in the loading position, a lug movably mounted to and beneath the surface, means connected to the second edge margin guide for simultaneously moving the lug half the distance and in the same direction as the second edge margin guide when the latter is moved while the surface is in the loading position, and means mounted on the frame for locating the lug in a fixed position along the direction of movement of the second edge margin guide when the surface is moved to the feeding position so that a line equidistant between the edge margin guides is always located in a given position relative to the frame.

3,934,871

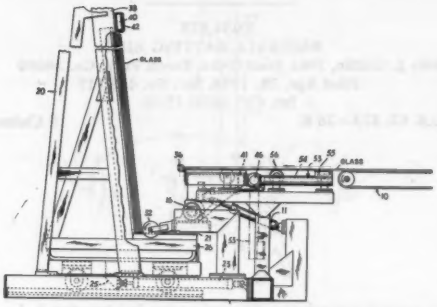
ACCUMULATOR

George A. Dean, Kansas City, Mo., assignor to Dean Research Corporation, Kansas City, Mo.

Continuation-in-part of Ser. No. 145,684, May 21, 1971, abandoned. This application May 7, 1973, Ser. No. 357,630

Int. Cl.² B65H *29/44*, *31/06*

U.S. Cl. 271—184 **26 Claims**



1. A sheet material accumulator comprising: a tiltable table movable from horizontal position towards vertical and on which the sheet material is normally carried in a horizontal position, said tiltable table having a lip thereon for retaining sheet material on said table during tilting thereof, said lip comprising a stop located at the end of the table and a return on said stop, said return being spaced from the table a distance sufficient to permit the edge of the sheet to slide between the table and return, means for tilting said table to move said sheet material towards vertical position; means for removing said sheet material from said table after said table has moved a selected distance toward vertical position; means for receiving said sheet material and means for reducing contact shock when said sheet material is placed on said receiving means.

3,934,872

PRINTED SHEET GUIDE MECHANISM IN OFFSET PRINTING PRESS

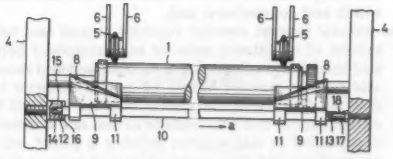
Yoshinori Honkawa, Hiroshima, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Filed Oct. 2, 1974, Ser. No. 511,367

Claims priority, application Japan, Oct. 3, 1973, 48-115298

Int. Cl.² B65H *29/70*

U.S. Cl. 271—188 **5 Claims**

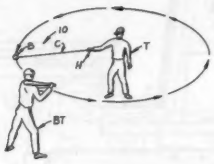


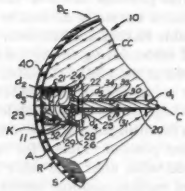
5. A printed sheet guide mechanism in an offset printing press having a delivery roller assembly and a pair of guide members each of which has formed integral therewith a slanted guide flap adapted to bend each edge of the printed sheet along its travelling direction to give stiffness to the sheet, said guide members being adjustably positionable along an axis parallel to the axis of said delivery roller, each of said guide members being made from a plate-like member and including:

a horizontal portion;

a vertical portion erected from the rear end of said horizontal portion;
a sloping portion slanting downwardly from the top end of said vertical portion at an inclination corresponding to the angle at which the printed sheets are delivered; and
a guide flap raised up with a slant from the inner side of the front end to the outer side of the rear end of said sloping portion.

3,934,873
BASEBALL BATTING AID
Billy J. Griffin, 3961 Scott Drive, Forest Park, Ga. 30050
Filed Apr. 29, 1974, Ser. No. 465,117
Int. Cl.² A63D *15/10*
U.S. Cl. 273—26 E **5 Claims**

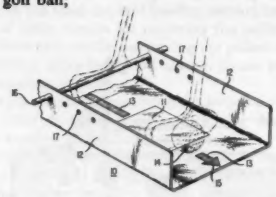




1. A baseball batting aid comprising:
a ball having a diametrically extending hole therethrough, one end of said hole having a counterbore of a prescribed depth communicating with the exterior of said ball, said ball having a shoulder between said hole and said counterbore;
a cord extending through said hole and into said counterbore, said cord having a knot thereon within said counterbore, said knot having a larger dimension than the diameter of said hole;
a sleeve member comprising a tubular section positioned within said hole around said cord, and an annular head flange integral with that end of said tubular section at said counterbore, said head flange extending over said shoulder and positioned between said knot and said shoulder within said counterbore; and,
an annular support member received around said tubular section of said sleeve member and juxtaposed between said head flange of said sleeve member and said shoulder, said support member having an outside diameter larger than the diameter of said counterbore and said ball being resilient about said counterbore so that said counterbore is expanded as said support member is pulled into said counterbore and then contracts as said support member is seated against said shoulder to lock said support member within said counterbore.

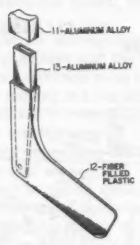
3,934,874
GOLF PUTTING AID
Frank D. Henderson, 32 Rolling Hill Drive, Chatham, N.J. 07928
Filed Apr. 7, 1975, Ser. No. 565,636
Int. Cl.² A63B *69/36*
U.S. Cl. 273—35 A **4 Claims**

2. A golf putting aid comprising;
a rectangular longitudinal member of substantially non-reflective material;
said member having a pair of longitudinal sidewalls;
a dimple on the longitudinal axis of said member for receiving a golf ball;



a centrally located reflective area adjacent to said dimple;
a visible longitudinal indicia extending for a major portion of the length of said channel and equidistant from said sidewalls, and;
a movable rod member mounted in said sidewalls transverse the longitudinal axis of said longitudinal member.

3,934,875
HOCKEY STICK
James Leland Easton, 15141 Mulholland Drive, Los Angeles, Calif. 90024, and Gary William Filice, 19544 Wells Drive, Tarzana, Calif. 91356
Filed Feb. 14, 1974, Ser. No. 442,640
Int. Cl.² A63B *59/12*
U.S. Cl. 273—67 A **5 Claims**



1. A hockey stick comprising a shaft, a blade and a shank interconnecting the shaft and the blade;
the shaft being formed of a metal tube having a rectangular cross-section;
the shank being formed of a metal tube having a rectangular cross-section with an upper portion adapted to mate removeably with the lower end of the shaft and a lower portion adapted to be affixed permanently to a molded plastic blade, the lower portion being tapered in at least one dimension from the upper portion to a smaller section at its lower ends and having at least one blade retaining recess in its surface, said recess being tapered from a relatively wide cross-section toward the shaft end to a narrower cross-section toward the blade end of the shank;
the shaft and the shank being joined in a four-plane bonded lap joint with the lower end of the shaft receiving and lapping the exterior of the upper portion of the shank;
the blade being formed of fiber reinforced plastic and molded permanently to the lower portion of the metal shank and substantially filling the blade retaining recess with the lower end of the shank extending substantially to the heel portion of the blade.

3,934,876
GAME RACKET

Daniel G. Haddad, Worcester, Mass., assignor to Norman S. Blodgett, Worcester, Mass.

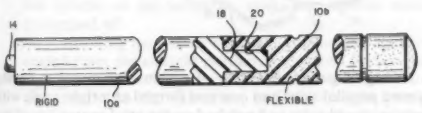
Filed Apr. 15, 1974, Ser. No. 460,737
Int. Cl.² A63B 49/02, 51/02
U.S. Cl. 273—73 C 8 Claims

1. A game racket, comprising: a rigid, one-piece, homogeneous frame having a curvilinear head portion, an intermediate throat and shank portion, and a handle portion integral with said head portion; said head, throat, shank, and handle portions having a solid cross-section; at least said head, throat and shank portions consisting of an entirely open-celled network of a plurality of interconnected plates traversing the entire area thereof and forming a honeycomb-like matrix; each of said plates having walls which are perpendicular to the plane of said racket and constituting the width dimension thereof; each of said plates having planar upper and lower surfaces parallel to the central plane of said racket, said planar surfaces being exposed at least at said head, throat and shank portions and constituting two ball contact surfaces of said head portion, the planar surfaces of each of said plates constituting the length dimension thereof; said width dimension being approximately equal to said length dimension; each plate further having a nonuniform thickness with one location of greatest thickness wherein said greatest thickness is less than each of said width and length dimensions and being oriented parallel to said contact surfaces of said racket; and hand grip means covering said handle portion to provide a gripping surface for the user.

3,934,877
POLICE DEFENSIVE IMPLEMENT

Davis L. White, Placida, Fla., assignor to Monadnock Lifetime Products, Inc., Fitzwilliam, N.H.

Filed Dec. 6, 1974, Ser. No. 530,089
Int. Cl.² F41B 15/02
U.S. Cl. 273—84 4 Claims

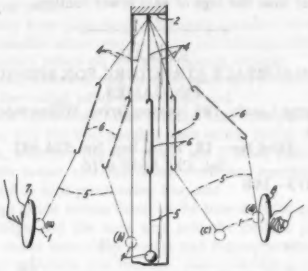


1. A police weapon, comprising two elongate members of equal length each having a portion which is relatively rigid and another portion which is relatively flexible such that the flexible sections will bend relative to the rigid sections, means connecting the members comprising a flexible cord connected at one end to the rigid portion of one of the elongate members and at the other to the rigid portion of the other of the elongate members so that the flexible portion of one of the elongate members constitutes a handle by means of which the implement is wielded and the flexible portion of the other elongate member constitutes an implement for inflicting a blow.

3,934,878
ERRATIC MOVEMENT TETHERED BALL

Stephen K. Haber, 240 E. 48th St., New York, N.Y. 10017

Filed Aug. 28, 1974, Ser. No. 501,322
Int. Cl.² A63B 71/02
U.S. Cl. 273—95 A 4 Claims



1. A tethered-ball game adapted for playing in a doorway by players equipped with paddles comprising:

a ball between 1 and 2 inches in diameter and weighing between 0.1 and 1 ounces;

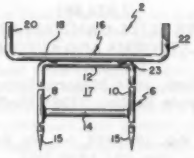
at least one flat paddle adapted to be held by at least one player for striking the ball; and

an elongated suspension member for suspending the ball from the center of a doorway at a height convenient for striking the ball with a paddle held by a player standing on one side of the doorway, the suspension member having an upper portion, an intermediate portion, and a lower portion, the upper and lower portions comprising lengths of a flexible filament and the intermediate portion comprising an elongated thin stiff link member having a length of approximately 6–24 inches and weighing less than 1 ounce but more than the combined weight of the ball and the upper and lower filament portions.

3,934,879
HORSESHOE TARGET POSTS

Frank E. Curtiss, 819 E. Erie St., Painesville, Ohio 44077, and Jack E. Curtiss, 5246 Corduroy Road, Mentor, Ohio 44060

Division of Ser. No. 143,014, May 13, 1971, abandoned, which is a division of Ser. No. 857,084, Sept. 11, 1969, Pat. No. 3,602,509. This application Mar. 20, 1974, Ser. No. 452,921
Int. Cl.² A63B 71/02
U.S. Cl. 273—104 4 Claims



1. A post member for use in an outdoor field game comprising,

a lower section having at least one closed target area adapted to be inserted into the ground,

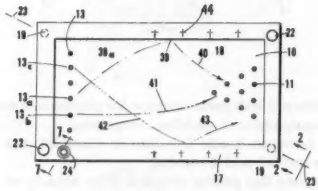
an upper section extending from the lower section having a plurality of arm-like projections defining other target areas adapted to receive in scoring registration a throwing object,

said lower section includes a pair of spaced legs extending generally parallel and outwardly from a bight portion,
said upper section including another pair of spaced legs extending generally parallel and outwardly from said bight portion in a direction opposite to said first mentioned pair of legs, and
said legs of said upper section are shorter and spaced apart farther than the legs of said lower section.

3,934,880
PLAYING SURFACE STRUCTURE FOR SPINNING TOP PIN GAMES

Lajos George Laszlo, 189 Newton Drive, Willowdale, Ontario, Canada

Filed Nov. 18, 1974, Ser. No. 524,487
Int. Cl.² A63F 9/16
U.S. Cl. 273—108 **3 Claims**



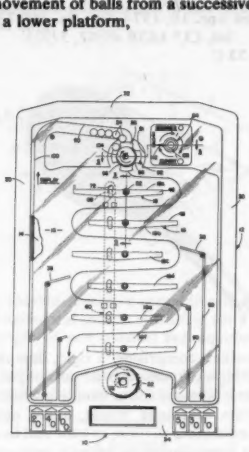
1. A playing surface structure for a spinning top pin game, the combination therewith of: rebound walls defining a rectangular perimeter for the playing surface, the latter being in the form of a flat sheet of rigid material the upper surface of which constitutes a playing surface having indicia thereon to define locations at which pins may be set up thereon; means fastening the playing surface member to said rebound wall members; a leg of fixed predetermined length at each corner of one pair of opposed diagonal corners of the rectangular playing surface and extending below said playing surface member to support the latter diagonally about the bottom ends of said legs; a level indicating device supported in one of said wall members at a predetermined gradient relative to the plane of the playing surface, the direction of said gradient being substantially at right angles to the diagonal between one pair of opposed corners; and an adjustable leg at each of the other corners of said side wall members extending therebelow for adjustment of the gradient of the playing surface to a predetermined value at which the levelling device indicates a level condition for said device.

3,934,881
MANIPULATIVE SKILL GAME APPARATUS HAVING TILTABLE PLATFORMS AND AUTOMATIC FEEDER MECHANISM

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316

Filed Feb. 10, 1975, Ser. No. 548,398
Int. Cl.² A63F 7/02
U.S. Cl. 273—110 **8 Claims**

1. Manipulative skill game apparatus comprising
a. a generally upright board having a front face,
b. a means on said board defining series of generally horizontally disposed platforms arranged generally below one another at said board front face, each of said platforms being tiltable about a generally horizontal axis extending forwardly from the front face of said board,
c. means attached to said board defining an enclosure around the said platforms and being at least partially transparent,
d. a plurality of balls within said enclosure
e. control means coupled to said platforms, and accessible from outside of said enclosure for tilting said platforms to effect movement of balls from a successively higher platform to a lower platform,

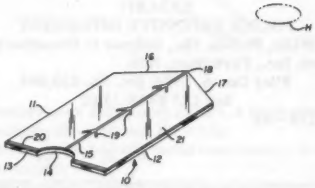


f. discharge means located in said enclosure above said platforms for automatically delivering the balls to the platforms at timed intervals, so that there will be more than one ball on the platforms unless the player completes the play sequence of each ball within its time interval.

3,934,882
GOLF GUIDE

Richard E. Whittaker, 302 S. Croton Ave., New Castle, Pa. 16103

Filed Dec. 11, 1974, Ser. No. 531,794
Int. Cl.² A63B 69/36
U.S. Cl. 273—183 A **8 Claims**



1. A golf guide consisting of a thin, flat member having spaced parallel sides and one end formed at a right angle with respect to said sides and notched on the axial center line of the member, the other end of the member being pointed with the apex of the point lying on said axial center line, a stripe on said member indicating said axial center line and extending between said notch and said apex of said pointed end.

3,934,883
DISK RECORD PLAYER

Robert L. Chambers, 2148 NW. 48th St., Miami, Fla. 33142

Filed Jan. 10, 1974, Ser. No. 432,190
Int. Cl.² G11B 15/00
U.S. Cl. 274—9 B **2 Claims**

1. A disc record support and drive device comprising:

a housing;

at least three rollers coupled to said housing and disposed in a common plane an equal radial distance from a predetermined point within said housing to the edge of said rollers, one of said rollers being pivotally moveable relative to said housing and said predetermined point;

means connected to one of said rollers and said housing for rotating said roller;

a phonograph cartridge;

cartridge support means coupled to said housing and said cartridge, said cartridge radially moveable along said cartridge support means; and

linkage means connecting said pivotally mounted roller and said cartridge for lifting said cartridge whenever said roller is pivoted, whereby a disc record inserted in the plane of said rollers to engage said rollers will move said pivotal roller lifting the cartridge mechanism above the surface of the record.

3,934,884

PRECISION PIECE SELECTOR ON GRAMAPHONE RECORD

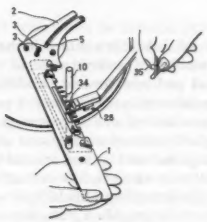
Kosuke Matsukata, 390 Tsurumi-cho, Tsurumi, Yokohama, Kanagawa, Japan

Filed June 7, 1974, Ser. No. 477,504

Claims priority, application Japan, June 8, 1973, 48-63859

Int. Cl.² G11B *3/00*

U.S. Cl. 274—9 RA **4 Claims**



1. An apparatus for precisely locating a selection on a phonograph record which has boundary zone grooves between the selections on the record and which is to be played on a record player having a rotating turntable, a spindle in the center of the turntable for centering and holding the record on the turntable, and a tone arm pivoted on an axis having a cartridge with a playing stylus secured thereto which may be manually positioned on the record on the turntable, said apparatus comprising:

piece selector means radially extending above and across the surface of the record player for slidably fitting around the spindle on the turntable, said piece selector means comprised of:

a flat positioning bar having a straight portion and a portion angled from the straight portion, the angled portion having a groove therein removably and slidably fitted around the spindle on the turntable, and the straight portion radially extending above and across the record and having a cut out portion in the side thereof facing against the rotational direction of the turntable and two parallel angled slots, one slot on each side of the cut out;

radial indication means removably connected to the said piece selector means between said piece selector means and the turntable for indicating the position of the boundary zones between the selections of the record when said piece selector means is fitted about the spindle, said radial indication means comprised of:

a radial adjustment plate beneath said positioning bar having a cut out in the side thereof opposing the rotation of the turntable and having two parallel slots perpendicular to the edge of the bar, one slot on each side of the cut out;

two bolts attached to said radial adjustment plate and fitted into the parallel angled slots of said positioning bar, whereby said radial adjustment plate is attached beneath said positioning bar;

a bottom plate below the radial adjustment bar having a groove therein running the length of the plate;

a needle setter rod removably fitted into the groove in said bottom plate;

boundary zone pins perpendicularly attached to the top of the needle setter rod at positions corresponding to the boundary zones on the phonograph record;

a top plate between said bottom plate and needle setter rod and the radial adjustment plate; and

two bolts removably fitted through said base plate, said top plate, and the two parallel slots in the radial adjustment plate, whereby the top plate, the bottom plate, and the needle setter rod thereinbetween are operatively connected to said positioning bar; and

cartridge guide means fitted to the tone arm for guiding the cartridge and the tone arm into the desired position in said radial indication means and for supporting the cartridge and tone arm thereon, said cartridge guide means comprised of:

a cartridge plate attached between the tone-arm, and

a supplemental cartridge plate fastened to and beneath said cartridge plate toward the free end of the tone-arm for positionig adjacent the boundary zone pin indicating the desired location on the record.

3,934,885

BEARING OF A PICK-UP ARM FOR A RECORD PLAYER

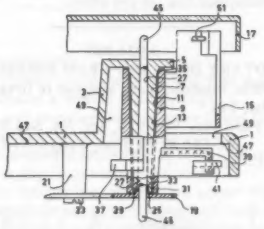
Gerhard Freiter, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,494

Claims priority, application Germany, Sept. 27, 1972, 2247446

Int. Cl.² G11B *3/10*

U.S. Cl. 274—23 R **8 Claims**



1. A pick-up arm bearing assembly for a record player with a cover plate, comprising a cover plate having first, second and third portions, said first portion being raised above said second portion, said third portion connecting between said first and second portions, said second portion having an opening therethrough below said first portion, a part of said opening extending beyond said first portion; a bearing column having a vertical axis, said column mounted below said first portion of the cover plate and extending downward, said cover opening part being in spaced relationship with said bearing column axis; a bearing body fitted coaxially over said bearing column to permit rotation about the axis of said column; a retaining member; means for mounting said retaining member under said cover plate so as to retain said body on said column; and bearing block means for attaching a pick-up arm for pivotal motion about a horizontal axis, comprising a lower portion disposed below the cover plate and connected to said bearing body and an upper portion having a cross-section in a horizontal plane smaller than said part of said opening and in spaced relationship with said axis corresponding to said

spaced relationship, said upper portion projecting upward above said part of said opening in the cover plate, said upper portion comprising means for pivotally mounting a pick-up arm about a horizontal axis, whereby said bearing body, bearing block means and retainer can be assembled to the record player from below the cover plate.

3,934,886

CORRUGATED RADIAL SPACER EXPANDER FOR COMPOUND OIL SCRAPING RINGS

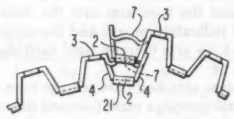
Syoji Okada, Ohmiya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Sept. 11, 1974, Ser. No. 505,190

Claims priority, application Japan, Sept. 11, 1973, 48-101672

Int. Cl.² F16J 9/06

U.S. Cl. 277—2 **5 Claims**



1. In a corrugated radial spacer expander adapted for use in combination with side rails to form a compound oil scraper ring, said expander being annular in shape and severed to present two opposing ends and having a circumferential corrugation consisting of successively alternating valleys and crests connected by intermediate flanks, the improvement comprising: protrusions in the form of partially struck out integral strips of said expander longitudinally briding neighboring flanks over the bottom of adjacent valleys at respective opposing ends, said strips including integral portions which are laterally offset when said strips overlie each other which prevent the valley adjacent one end of said expander from being received within the valley adjacent the other end, when said ends are overlapped one on the other.

3,934,887

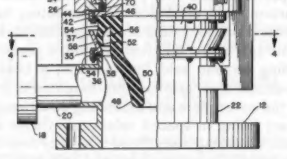
ROTARY DRILLING HEAD ASSEMBLY

Morris S. Biffle, Midland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 30, 1975, Ser. No. 545,507

Int. Cl.² F16D 3/06; F16J 15/16

U.S. Cl. 277—31 **15 Claims**



1. In a rotary drilling head assembly for wellbore forming operations having a main body for connection to the upper end portion of a wellbore casing and formed into an upper and a lower stationary housing, a central axial bore formed through said upper and lower housings for receiving a toolstring therethrough, a rotating bowl rotatably journaled to the upper housing, a stripper seal means concentrically affixed to the rotating bowl for jointly rotating with and sealingly engaging a toolstring placed therethrough; and an outlet pipe connected to the lower housing in flow relationship to the axial bore; the improvement comprising:

a circumferentially extending annular seal seat formed on said lower housing at a location spaced above the inlet to said outlet pipe; a circular rotating fluid seal means mounted to be rotated concurrently with said stripper seal means and sealingly engaging said annular seal seat.

3,934,888

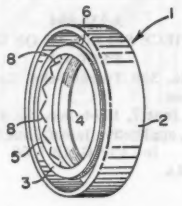
BI-DIRECTIONAL ROTARY SHAFT SEAL

Walter A. Lutz, Lexington, Ky., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 863,587, Oct. 3, 1969, abandoned. This application Mar. 13, 1974, Ser. No. 450,553

Int. Cl. F16j 15/32

U.S. Cl. 277—134 **7 Claims**



1. A bi-directional seal for a rotatable shaft, said seal including a member molded of resilient material which in its initially molded, unused and undeformed condition has an annular sealing lip of predetermined diameter, a pair of narrow elongated ribs on one side of said lip converging toward said lip, a generally cylindrical surface segment on said ribs at their convergence adjacent said lip and coaxial therewith and lying at approximately the same radius at least as large as that of said lip, said ribs extending angularly in opposite directions from said lip so as to provide a pumping action when said lip and said surface are in contact with said rotating shaft regardless of the direction of rotation of said shaft whereby fluid leaking past said sealing lip is pumped toward the other side of said lip by one or the other of said ribs.

3,934,889

FIRE SEAL

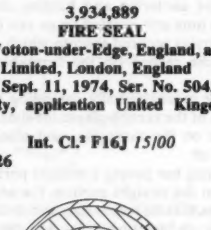
Stanley Smith, Wotton-under-Edge, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Sept. 11, 1974, Ser. No. 504,918

Claims priority, application United Kingdom, Sept. 22, 1973, 44560/73

Int. Cl.² F16J 15/00

U.S. Cl. 277—226 **6 Claims**



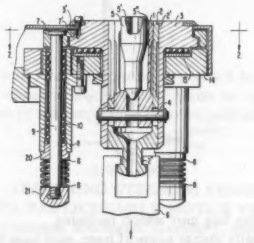
6. A fire seal comprising an inner tube of a silicone elastomer material and which is capable of being pressurized by fluid under pressure, the inner tube being surrounded by an intermediate layer of a resilient fire resistant carbon felt, the

intermediate layer in turn being surrounded by a wear resistant sleeve of a reinforced rubber material.

3,934,890
COLLET CHUCK WHICH CAN BE CENTERED RELATIVE TO ONE OR MORE AXES OF THE WORKPIECE TO BE MACHINED AND SUITABLE FOR MACHINE TOOLS

Ugo Buzzi, Agno, Switzerland, assignor to Albe S.A., Agno, Switzerland

Filed Sept. 25, 1974, Ser. No. 509,224
Claims priority, application Switzerland, Oct. 8, 1973, 14332/73; Sept. 7, 1974, 12144/74
Int. Cl.² B23B 31/20
U.S. Cl. 279—16 7 Claims

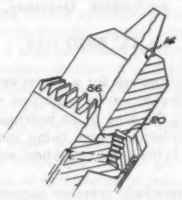


1. A collet chuck which can be centred relative to an axis of the workpiece to be machined and suitable for machine tools in general and in particular machine tools having a number of successive positions characterised by an inner prehensile member (1) capable of gripping the workpiece, an intermediate member (2) coaxial to the first with a conical seating which slides axially causing the prehensile member (1) to close on the workpiece to be machined (5); an outer casing (3) rigidly attached to the prehensile member (1) by means of a pin (4), an outer ring (7) fitted with radial play around the periphery of outer casing (3), spring members (8) of variable tension to compress the outer casing (3) and outer ring (7) against each other to lock them together by friction, and pusher means (9) operable axially by a thrust member to unlock said outer casing and said outer ring.

3,934,891
DRILL CHUCK AND METHOD OF ASSEMBLY

George C. Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Co., Ltd., Sheffield, England

Filed Apr. 9, 1974, Ser. No. 459,382
Claims priority, application United Kingdom, Apr. 11, 1973, 17343/73
Int. Cl.² B23B 31/12
U.S. Cl. 279—61 4 Claims



1. A slidable jaw rotary chuck having a cylindrical body provided with a work receiving bore extending axially and partway into its front end, a group of jaw tracks in the body converging downwardly and forwardly to the axis of said bore, a work gripping jaw slidable in each track, a circumferential groove about the body opening into the tracks into which groove screw threads upon each jaw are exposed, a jaw actuating nut disposed in the groove having internal screw threads connected with the exposed screw threads of the jaws for selectively advancing and retracting the jaws as a set along the tracks to open or closed condition, an external key operable gear unitary with the nut having rotation relative to the body for imparting a selected direction of rotation to the nut, and a sleeve rotatable with and extending rearwardly from the gear covering over the periphery of the body rearwardly of the gear; wherein a port extending radially from the bore through the body opens into the groove to communicate directly with the screw threads of the nut, the bore being adapted to be pressurized through its front end with lubricant for passage of the lubricant through the port to the screw threads of the nut and as a consequence of rotation of the nut passage of the lubricant from the screw threads of the nut to the screw threads of the jaws.

3,934,892
ICE SKATE

Hugh E. Balkie, Chateauguay Center, Canada, assignor to Kenbruidge Holdings Limited, Canada

Filed June 20, 1974, Ser. No. 481,338
Claims priority, application Canada, May 7, 1974, 199191
Int. Cl.² A63C 1/02
U.S. Cl. 280—11.12 12 Claims

1. A skate comprising
a. a blade curved throughout its length in a longitudinal plane to define a convex running edge,
b. a pair of wall members having lower edges connected to said blade throughout its length,
c. said wall members extending upwardly from said blade while diverging from each other, and
d. horizontal flanges extending from upper edges of said wall members for securing to a boot sole to form in cross-section a triangular structure therewith at least at front and rear portions of the skate,
e. wherein said wall members have upturned, vertically extending, lower edge portions abutting side portions of the blade with inturned, horizontally extending edges abutting an upper surface of the blade, said upturned portions and inturned edges, copperating to form an elongated socket having a curvature corresponding to that of said blade, said blade being secured within said socket.

3,934,893
SLALOM SKI DEVICE

Joseph A. Greenleaf, 209 Village Drive, Lansing, Mich. 48910

Filed Oct. 4, 1974, Ser. No. 512,065
Int. Cl.² A63C 9/00
U.S. Cl. 280—11.35 K 13 Claims

1. In a ski device, the combination including a planar sole plate, an elongate toe stem connected to and projecting longitudinally forwardly from said sole plate, a ball fixed to the free end portion of said toe stem, a planar base plate, a support

member comprised of a pair of support elements each connected to said base plate for pivotal movement about an axis normal to the plane of said base plate, said support elements

defining a socket adapted to receive said ball, said ball and socket connecting said toe stem to said support member for limited universal movement relative thereto.

3,934,894

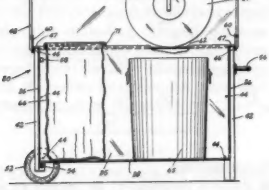
UTILITY CART AND BAG HOLDER THEREFORE

William M. Hoeffken, 301 N. 41st St.; Russell W. Hoeffken, 124 Columbus Drive, and Paul W. Hoeffken, 120 N. 36th St., all of Belleville, Ill. 62223

Filed Apr. 25, 1974, Ser. No. 463,992

Int. Cl.² B62B 1/14

U.S. Cl. 280—47.19 **12 Claims**



1. A cart for containing, transporting and storing trash and other bulky materials adapted to selectively use both bag and can containers and to protect the material contained therein from the effects of weather, fire and animals, having means forming an enclosure; means forming an opening into the enclosure, means for selectively opening and closing the opening, the opening and closing means extending downwardly beyond the opening and positioned to deflect water away from the opening; frame means supporting the enclosure; means mounted on the frame means for moving the enclosure; recess means integral with the opening and closing means for storing and supporting a trash can lid; means cooperating with the downwardly extending portion of the opening and closing means limiting the movement of the opening and closing means in a direction away from the opening; support means on the enclosure adjacent to the opening; removable means in the enclosure for selectively using bags and cans in the enclosure, includiing means for selectively holding a bag in an article receiving relationship within the enclosure, the holding means having at least one downwardly extending projection for cooperating with the support means to position the holding means within the enclosure, and means for hanging the holiday means on the support means, the holding means including the hanging means being adapted to support a trash bag in an article receiving relationship within the enclosure with an open end of the bag positioned between the hanging means and the support means.

3,934,895

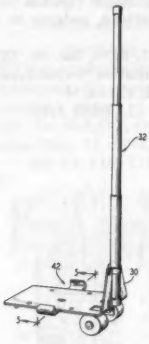
BOWLING BAG CART

George G. Fox, 2692 Craig Drive, Des Plaines, Ill. 60018

Filed Nov. 20, 1974, Ser. No. 525,555

Int. Cl.² B62D 1/12

U.S. Cl. 280—47.26 **7 Clai**



1. A bowling bag cart which includes

a substantially planar support base, said base having an area to at least support a major portion of the bottom area of a bowling bag and not being substantially enlarged relative to said bottom area of the bowling bag,

a forward pair of wheels rotatably mounted to the bottom of said base portion,

a downwardly extending rear rest member in the bottom of the base to support said cart in resting position,

means for holding the bottom of the bag to said base portion,

a front plate at the forward end of the base, the plane of said front plate being substantially normal to the plane of the base portion, and

a retractable handle having a plurality of telescoping tubular portions including a lower and an upper tubular portion, said lower portion being securely fixed to a face of the front plate, the retracted position of said handle not extending beyond at least carrying handles at the top of the bowling bag, and the extended position of the handle allowing hand pulling action to trundle the cart along a support surface.

3,934,896

STEERING ARRANGEMENT FOR MOTOR VEHICLES

Bela Barenyi, Maichingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 2, 1973, Ser. No. 329,094

Claims priority, application Germany, Feb. 3, 1972, 2205014

Int. Cl.² B62D 1/18

U.S. Cl. 280—87 R **25 Claims**

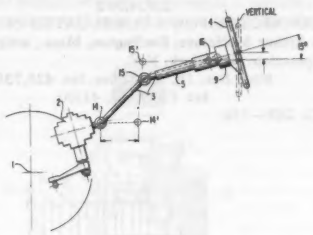
1. A steering arrangement for a motor vehicle comprising:

steering column means having a portion which is pivotally mounted within the area of an instrument panel means, said steering column means being inclined in a given direction and having a steering wheel supported at an end thereof,

at least one intermediate member supporting the steering column means within the area of a vehicle front axle, said member having a different inclination than the steering column means, and

means for automatically positioning said steering wheel in a substantially vertical plane in front of an impinging body upon application of rearwardly directed deforma-

tion forces in said area of said front axle such that said intermediate member is moved rearwardly and upwardly



wherein said steering column is pivoted to position said steering wheel in said vertical plane to optimize force dissipation of said impinging body on said steering wheel.

3,934,897

ENERGY ABSORBING STEERING COLUMN FOR VEHICLES, PARTICULARLY MOTOR VEHICLES

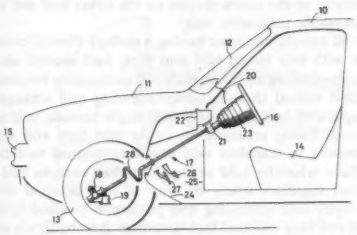
Jakob Moos, Oestrich, Rheingau, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 9, 1974, Ser. No. 504,193

Claims priority, application Germany, Sept. 20, 1973, 2347355

Int. Cl.² B62D 1/18

U.S. Cl. 280—87 R **4 Claims**



1. In a vehicle having dirigible road wheels, a steering column assembly comprising elongated and generally cylindrical steering shaft means, said steering shaft means having upper and lower portions, means operatively connecting said lower portion to said road wheels, manual steering means operatively secured in a predetermined position in said vehicle to one end of said upper portion of said steering shaft means, mounting means secured in said vehicle operatively connected to one of said portions of said steering shaft means for supporting said steering shaft means for limited rotation within said vehicle, said lower portion of said steering shaft means having an energy absorbing helical part integrally formed therewith, said helical part having at least 1 convolution, said convolution having a diameter larger than the diameter of the remainder of said steering shaft means, said helical part being adapted to axially collapse in response to an impact load applied to one end of said steering shaft means to absorb impact energy and so that said one end of said steering shaft means and said manual steering means connected thereto substantially remain in position in said vehicle.

3,934,898

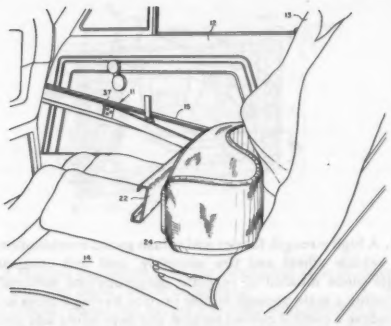
PASSENGER RESTRAINT DEVICE

John C. Long, 90 Broad St., Charleston, S.C. 29401

Filed Mar. 10, 1975, Ser. No. 557,092

Int. Cl.² B60R 21/10

U.S. Cl. 280—150 B **11 Claims**



1. Passenger restraint apparatus for a vehicle having a side door comprising a restraint arm, mounting means on said door pivoting one end of said arm for movement between an inoperative position extending along the door and an angularly related position for restraining a seated passenger, said mounting means being adjustable along the door to conform the restraint to different passenger sizes, means at the door automatically responsive to movement of said arm to said restraint position for releaseably latching said arm in restraint position, and manual means for releasing the latched arm.

3,934,899

FASTENING ARRANGEMENT OF ONE SHEET-METAL MEMBER PROVIDED WITH A RIM IN ANOTHER SHEET-METAL MEMBER ALSO PROVIDED WITH A RIM

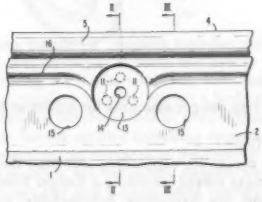
Gerhard Burk, Magstadt, and Dieter Willem, Sindelfingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 16, 1974, Ser. No. 515,339

Claims priority, application Germany, Oct. 17, 1973, 2352181

Int. Cl.² B62B 9/16

U.S. Cl. 280—152 R **26 Claims**



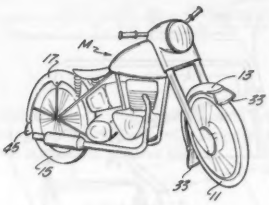
1. A fastening arrangement of a sheet metal member provided with rim means at another sheet metal member also provided with rim means, characterized in that embossment means are arranged at the rim means of one of said sheet metal members which keep the two sheet metal members at a distance from one another, the two sheet metal members being fastened together within the area of said embossment means.

3,934,900

FENDER AND SPLASH GUARD

Robert E. Wilson, 3002 Melvin, Rochester, Mich. 48063

Filed Sept. 23, 1974, Ser. No. 508,048
Int. Cl.² B62B 9/16
U.S. Cl. 280—152.3 7 Claims



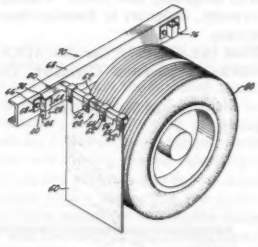
1. A high strength fender and splash guard combination unit for vehicle wheel and tire assembly, said unit comprises a single piece molded of resilient polypropylene material and including a main arcuate fender portion having a cross section including a central curved section and depending side sections joined to the sides of the curved section to form a relatively sharp angled juncture portion, and an integral splash guard portion extending tangentially from one end of the main arcuate portion, said splash guard portion having a cross section comprising an arcuate generally conforming to the shape of the central curved section of the main fender portion, and attaching means in said arcuate fender portion for mounting said unit on a vehicle.

3,934,901

QUICK RELEASE MUD FLAP HANGER ASSEMBLY FOR TRUCKS AND TRAILERS

obert C. Hammerly, 2061 Norma Lane, Anaheim, Calif. 92802

Filed Nov. 29, 1974, Ser. No. 528,347
Int. Cl.² B62B 9/16
S. Cl. 280—154.5 R 13 Claims



1. A mud flap hanger assembly for trucks and trailers, comrising:

a. a mud flap,

b. hanger means for supporting said mud flap,

said hanger means including a hanger having a first leg,

a second leg extending substantially perpendicularly thereto, and a resilient portion interconnecting said first and second legs,

said resilient portion including a plurality of coplanar bends, each of said bends being less than about 90°,

c. connecting means for connecting said mud flap to said first leg, and

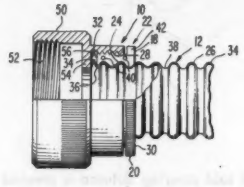
d. support means, adapted for mounting on the frame of a truck or trailer, for supporting said second leg with said mud flap disposed rearwardly of wheels of said truck or trailer whereby to intercept material rearwardly thrown therefrom.

3,934,902

CONNECTOR FOR A CORRUGATED CONDUIT

James Arthur McNamee, Burlington, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,735
Int. Cl.² F16L 41/00
U.S. Cl. 285—156 2 Claims



1. In combination:

a first annular member adapted to receive an annular corrugated deformable conduit comprising two identical halves having at least one annular corrugation formed in an internal surface thereof and terminating in an end face intersecting said surface, said end face terminating at and intersecting said one corrugation solely along the crest of said one corrugation so that a portion of said conduit extends beyond said end face when said first member is disposed about said conduit, said first annular member having an external screw thread coaxial with said corrugation and comprising two identical interdigitized helical screw threads arranged to form a single externally threaded member, the screw thread on each half being identical to the screw thread on the other half and interchangeable therewith, and

a second annular member having a surface thereof coextensive with and facing said end face, said second annular member having an internal thread comprising two interdigitized helical threads complementing and arranged to couple with said external helical screw threads, said screw threads being arranged to cause said first and second members to translate said end face toward said facing surface whereby said second member secures said two halves together solely by way of said internal thread, whereby said extending end portion is crushed between said end face and said facing surface thereby firmly securing said conduit to said first and second members, and connector engaging means formed in said second member.

3,934,903

FUEL INJECTION NOZZLE ARRANGEMENT

Karl Hofmann, Aldingen, and Walter Mladek, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 31, 1974, Ser. No. 438,417
Claims priority, application Germany, Feb. 20, 1973, 2308261
Int. Cl.² F16L 41/00
U.S. Cl. 285—156 11 Claims

1. A fuel injection nozzle arrangement for internal combustion engines comprising, in combination:

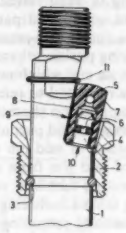
a. a nozzle holder;

b. a hose serving as a fuel supply conduit;

c. a tubular socket connected to and extending outwardly from a surface of said nozzle holder and adjacent to an abutment surface of the nozzle holder;

d. a hose nipple forming connection means between said nozzle holder and said hose, said hose nipple including an

affixable portion having a bore within which the tubular socket is received for mounting the hose nipple to the nozzle holder and an outer surface which is at least coextensive with said bore and is substantially parallel to the abutment surface when the hose nipple is mounted to the tubular socket, said hose nipple engaging the abutment



surface when mounted to the tubular socket to provide a secure fit of the hose nipple to the nozzle holder;

e. a sealing means positioned between an internal surface of said bore and an opposing surface of said tubular socket; and

f. at least one hose coupling member coupled to said affixable portion.

3,934,904

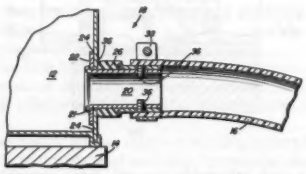
TRIPLE NIPPLE

Joseph B. Hord, 312 W. Saunders, Maxton, N.C. 28364

Filed Nov. 5, 1974, Ser. No. 521,235

Int. Cl.² F16L *41/00*

U.S. Cl. 285—158 **2 Claims**



1. In combination, a container having an opening in the peripheral wall thereof, a flexible hose, and a nipple connecting the hose to the container, said nipple comprising an inner cylindrical sleeve extending through the opening and having an outwardly flared inner end disposed interiorly of the container, an annular seal member interposed between the flared end of the inner sleeve and the container in peripherally enclosing relation to the opening for sealing the inner sleeve with respect to the opening, an outer cylindrical sleeve telescoped over the inner sleeve and disposed externally of the container, an elongated gasket of resilient material encircling said inner sleeve and disposed between the outer surface of the wall of the container and the outer sleeve, each of said sleeves having radial screw threaded openings therethrough, set screws threaded through said openings in the sleeves and maintaining the sleeves in predetermined longitudinal relationship, the length of said gasket being normally greater than the distance between the container and the inner end of said outer sleeve when the set screws are positioned through the openings whereby the gasket is maintained in compressed condition in sealed relation to the wall of the container peripherally of the opening, said hose being telescoped over and secured to the outer sleeve.

3,934,905

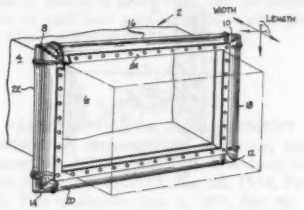
EXPANSION JOINT

Donald Fredrick Lockard, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Jan. 7, 1974, Ser. No. 431,192

Int. Cl.² F16L *51/02*

U.S. Cl. 285—229 **7 Claims**



1. A flexible expansion joint for joining the ends of spaced-apart adjacent ducts, which comprises:

a. a tubular connector having a specific configuration which includes: a plurality of corners; a plurality of sides each of which connects two of said corners; and terminal end portions adapted to mate with the facing ends of said ducts; and

b. means comprising a center section and two adjacent expansion sections incorporated in each of said corners with each of said sections extending axially of the connector to permit axial movement of said connector while maintaining a constant surface area of said connector.

3,934,906

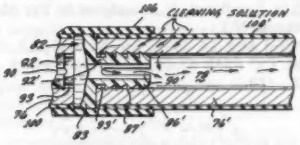
MEANS FOR COUPLING AND SEALING MEMBRANE CARRYING TUBE SECTIONS

Frank R. Shippey, Thousand Oaks; Timothy C. Vance, Los Angeles, and Fred E. Martin, Newbury Park, all of Calif., assignors to Raypak, Inc., Westlake Village, Calif.

Filed Feb. 15, 1974, Ser. No. 442,788

Int. Cl.³ B01D *29/10*

U.S. Cl. 285—371 **9 Claims**

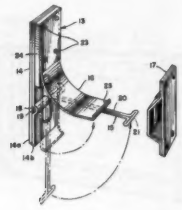


1. A coupling means for coupling together sections of porous tubular cores having axial bores and having a separating membrane coating the surface thereof, the coupling means comprising a connector member having a body part configurated to fit between adjacent ends of core sections, the connector member having nipples extending oppositely from the body part adapted for securement in the ends of the bores of adjacent core sections, the connector member having an axial bore therethrough and said nipples being configurated to seal the joints between the connector member and adjacent ends of core members, each of said nipples having circumferential barbs configurated to provide securement in bores of adjacent core sections, there being spaces between barbs inside the bores, axial slots formed in the material of the nipples to provide axial communication between spaces between barbs whereby cleaning fluid can permeate through a core into the spaces between barbs and can then travel axially to the end of a nipple or the interior of the axial bore.

3,934,907
VEHICLE DOOR LATCH

Daniel A. McGillivray, 1021 Edwards St., Waukegan, Ill. 60085

Filed Aug. 23, 1974, Ser. No. 500,159
Int. Cl.² E05C 19/06, 19/10
U.S. Cl. 292—121 5 Claims



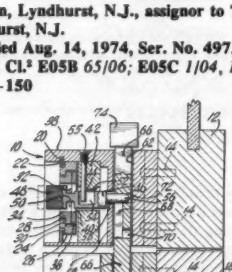
1. A latch assembly including a mounting plate adapted to be affixed to a vertical surface, a normally vertical latch bar having an upper end pivotally attached to the plate for outward swinging movement of the bar in a vertical plane normal to the plate, the bar having an opposite free end adapted to be detachably received in the recess of a keeper, wherein the improvement comprises

a vertically-elongated spring arm having an upper end secured to said plate substantially above the pivotal attachment of said bar to said plate and having a lower end slidably engagable with said bar for yieldably resisting lifting movement of the bar's free end and for retaining said free end within the recess of said keeper, said spring arm being substantially wider than the portion of said bar in slidable engagement therewith and having its free end curved away from said bar, said spring arm in an untensioned state having its lower end spaced outwardly from said bar in the direction of pivotal movement of said bar, whereby, said bar may be grasped and swung outwardly a limited distance of free movement before slidably engaging said spring arm.

3,934,908
LOCK WITH RETAINER

Michael Rifkin, Lyndhurst, N.J., assignor to The Magne-Lok Co., Lyndhurst, N.J.

Filed Aug. 14, 1974, Ser. No. 497,417
Int. Cl.² E05B 65/06; E05C 1/04, 13/02
U.S. Cl. 292—150 2 Claims

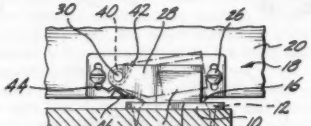


1. A lock assembly comprising a housing, a locking bolt axially movable therein, a lock pin perpendicular to said bolt and longitudinally movable in said housing between locking and unlocking positions, said pin being formed with a lock bore receiving a part of said bolt when said pin is in said locking position thereof, so that when said part of said bolt is in said bore said bolt maintains said pin in said locking position thereof, said pin being longitudinally movable to said unlocking position thereof upon retraction of said part of said bolt from said bore and said pin being formed with a longitudinal groove which extends from said bore and in which said part of said bolt is situated during movement of said pin from said locking to said unlocking position thereof, and limiting means carried by said housing and engaging said bolt for limiting the latter only to axial retraction movement out of said bore to an extent where said part of said bolt remains situated in said groove during movement of said pin from said locking to said unlocking position thereof, said groove having distant from said bore an end which engages said part of said bolt when the latter is retracted to release said pin for movement to said unlocking position thereof, whereby said end of said groove cooperates with said part of said pin for determining the unlocking position of said pin while at the same time preventing removal of said pin from said housing with said limiting means preventing removal of said bolt from said housing, said limiting means including a portion of said bolt formed with a longitudinally extending opening and a limiting pin carried by said housing to remain stationary with respect thereto, said limiting pin extending into said opening and engaging one end of said opening when said bolt is retracted from said bore so that said limiting pin by engaging said one end of said opening maintains said part of said bolt in said groove of said pin.

3,934,909
PUSH RELEASABLE MAGNETIC LATCH

William J. Van Natter, 18414 94th NE., Bothell, Wash. 98011

Filed July 23, 1973, Ser. No. 381,495
Int. Cl. E05c 19/16
U.S. Cl. 292—251.5 12 Claims



1. In a push releasable magnetic latch assembly to latch a movable object to a stationary object, as in latching a door to a stationary structure, said objects being adapted to move relative to one another on a general path of travel toward each other and away from each other into, respectively, latching and unlatching positions, where the latch assembly comprises:

a first latch member mounted to one of said objects and comprising first magnetic means,

a pivotal second latch member comprising an arm member and second magnetic means mounted thereto, said arm member being pivotally mounted to said other object for movement about an axis of rotation whereby said arm member is movable between a forward latching position with said first and second magnetic means being proximate one another in magnetic latching relationship and a rearward position with said first and second magnetic means spaced from one another to weaken the magnetic attraction therebetween and position the magnetic means in non-latching relationship,

the improvement comprising in combination:

stop means on the same object as said rotatable second latch member for positioning said arm member in a forward position for accurately aligning the movable object in a closed position relative to the stationary object,

push means on the arm member of the pivotal second latch member, said push means being spaced from said axis of rotation and positioned at a location which is between

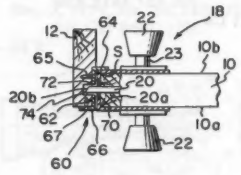
said axis of rotation and said second magnetic means and forwardly toward said first object, such that as said arm member swings between its forward and rearward positions, said push means engages said first object, such that said arm member is capable of acting as a lever arm against said first object,

spring means operatively engaging said arm member to urge said arm member from its rearward position to its forward position against said stop means for repositioning the objects in a closed aligned position and for propelling the movable object away from the stationary object to overcome the weakened magnetic attraction of the first and second magnetic means when moving from said rearward position to said forward position such that the movable object swings open away from said stationary object.

3,934,910
DOOR GUARD

Edward Radke, 1733 S. Carter, Midland, Mich. 48640

Filed Dec. 12, 1974, Ser. No. 531,979
Int. Cl.² E05C 1/00
U.S. Cl. 292—346 1 Claim



1. In combination:

a door having inner and outer sides and generally vertical lateral edges;

a door lock, mounted on said door including

a door locking bolt laterally movable between a projecting position laterally outwardly beyond at least one lateral edge of said door and a laterally inner position; and

rotatable bolt actuating means extending generally transversely to the plane of said door for moving said bolt as said bolt actuating means is rotating;

an auxiliary lock mounted on said door along said one lateral edge in vertically spaced relation with said first mentioned lock, said auxiliary lock including a bolt movable in a lateral path between a projecting position projecting beyond said one lateral edge and a laterally inner position, said auxiliary lock including second bolt actuating means extending transversely to the plane of said door;

a one piece lock guard including an elongate channel, being U-shaped in section, having a base generally perpendicular to the plane of said door with aperture means therethrough;

bolt plate means received in said aperture means and mounted on said door with the outer face of said bolt plate means being flush with the outer face of said base;

said bolt plate means having additional aperture means therethrough slidably receiving said bolts;

said lock guard including a pair of confronting flange portions, generally parallel to the plane of said door bearing against said inner and outer sides of said door, at least one of said flange portions having aperture means therethrough receiving said bolt actuating means; and

a longitudinally extending strike plate portion adapted to be vertically disposed between said door and a door jamb, having aperture means therein for receiving said bolts in said projecting positions,

said strike plate portion including

a transversely extending door stop flange on the inner end of said strike plate portion extending transversely to the plane of said door in a direction toward said door, and

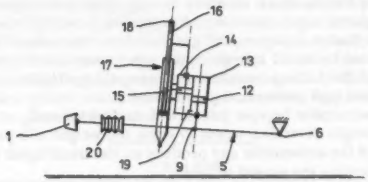
an oppositely directed mounting flange at the outer edge of said plate portion for engaging the outer face of said door jamb;

said door including a recessed portion receiving the base portion of said lock guard such that the laterally outer surface of said base portion is flush with the laterally outer edge portion surface of said door.

3,934,911
VEHICLE BUMPER ARRANGEMENT

Conrad Oehlerking, Braunschweig, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Division of Ser. No. 436,119, Jan. 24, 1974, Pat. No. 3,879,074. This application Jan. 2, 1975, Ser. No. 538,143
Claims priority, application Germany, Feb. 3, 1973, 2305417
Int. Cl.² B60R 19/04
U.S. Cl. 293—68 3 Claims



1. In a vehicle having at at least one end thereof bumper means including a bumper oriented transversely of the vehicle and located at a distance from a travelled surface on which the vehicle is supported, the improvement of means for maintaining the distance between the bumper and the travelled surface generally constant comprising:

a. support means for supporting the bumper, the support means including lever means mounting at one end thereof the bumper,

b. first means mounting the support means and coupled to the other end of the lever means, and

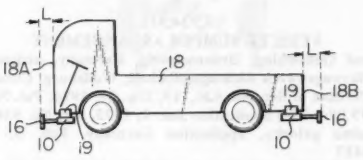
c. second means mounting the support means and including a first cylinder coupled to a wheel for the vehicle and adapted to contain a fluid under pressure, a second cylinder communicating with the first cylinder and adapted to contain a fluid under pressure, the second cylinder also being coupled to the wheel, a first piston coupled to the vehicle body and received in the first cylinder for reciprocating movement, and a second piston coupled to the lever means intermediate the ends thereof and received in the second cylinder for reciprocating movement,

the first and second mounting means imparting different movements to the support means upon movement generally perpendicular to the travelled surface by a vehicle body portion located adjacent the bumper, the different movements imparted to the support means effecting movement of the bumper relative to the adjacent vehicle body portion opposite in direction and approximately equal in amplitude to the movement of the adjacent vehicle body portion.

3,934,912
VEHICLE ENERGY-ABSORBING SYSTEM WITH ADJUSTABLE ABSORPTION CAPACITY

Yoshiyuki Ogihara, and Norimoto Aya, both of Yokosuka, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed July 19, 1974, Ser. No. 489,914
Claims priority, application Japan, July 23, 1973, 48-80862
Int. Cl.² B60R *19/02*
U.S. Cl. 293—73 **2 Claims**



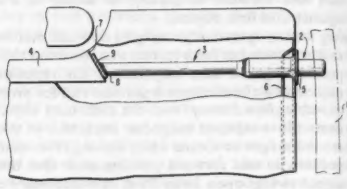
1. In combination with an automobile an impact energy absorption system comprising:
- a hydraulic shock absorber having a hydraulic cylinder, a piston-rod received in and protruding from said hydraulic cylinder, a pressurized gas chamber communicable with said hydraulic cylinder and a valve means for the control of fluid communication between said hydraulic cylinder and said pressurized gas chamber;
- a retractable bumper joined with said piston-rod;
- a weight detection means to sense the weight of a payload of the automobile and produce an electrical signal representing the sensed weight;
- a pressure regulation means for varying a gas pressure in said pressurized gas chamber;
- a carriage means for supporting said hydraulic cylinder in such a position that said bumper is located at a distance externally from an end of the automobile and selectively moving said hydraulic cylinder in the longitudinal direction of the automobile; and
- an electrical control means for controlling said pressure regulation means and said carriage means in response to said electrical signal, so that an energy absorption capacity in a collision of the automobile represented by the product of a resistance offered by said shock absorber against a retracting movement of said bumper and a distance travelled by said bumper until coming into contact with said end can be varied depending on said weight of said payload.

3,934,913
BUMPER SUPPORT STRUCTURE

Hubert Hutai, Grafenau-Datzingen, and Wolfgang Fischer, Leinfelden, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 27, 1974, Ser. No. 455,412
Claims priority, application Germany, Mar. 27, 1973, 2315105
Int. Cl.² B60R *19/04*
U.S. Cl. 293—99 **13 Claims**

1. A motor vehicle which includes a vehicle body and at least one bumper means that is supported at the vehicle by way of impact absorber means, and longitudinal bearer means which extend approximately in extension of the retraction direction of the impact absorber means, characterized in that the impact absorber means are supported at end faces of the longitudinal bearer means by interposition of a buckling-resistant structural part which extends within the confines of the vehicle body, and wherein the end faces of the longitudinal bearer means are provided with a bevelled-off surface at

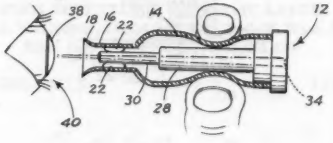


which abuts the free end of the structural part which has a complementary bevelled surface.

3,934,914
DEVICE FOR INSERTING AND REMOVING CONTACT LENS

Eben H. Carruthers, P.O. Box 40, Warrenton, Oreg. 97146

Filed July 11, 1974, Ser. No. 487,729
Int. Cl.² A61F *9/00*
U.S. Cl. 294—1 CA **7 Claims**



1. A device for use in inserting and removing a contact lens comprising:
- an elongate, hollow tube having a lens holding portion at one end thereof opening into the interior of said tube and a portion of said tube spaced from said one end being resilient to accommodate manual flexing of opposed sides thereof toward each other and to return substantially to their original configuration when released,
- a light transmitting closure element attached to and providing an airtight closure of the other end of said tube, and
- an elongate, substantially rigid, straight light transmitting shaft of smaller side-to-side dimension than the interior of said resilient portion of the tube secured at one of its ends to said closure element and extending axially of said tube through the resilient portion of said tube, with its other end adjacent but spaced inwardly from said lens holding portion of the tube, said shaft being operable to prevent said opposed sides of the tube from being pressed into contact with each other, thus to maintain a line of sight light path extending axially of said tube from said closure element to said lens holding portion during flexing of said tube walls toward each other.

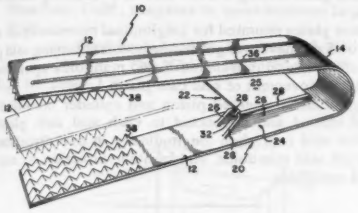
3,934,915
DISPOSABLE UTILITY TONGS

Norbert J. Humpa, 100 Aspen Drive, Schaumburg, Ill. 60172

Filed Mar. 9, 1973, Ser. No. 339,930
Int. Cl.² B25B *9/02*
U.S. Cl. 294—16 **10 Claims**

10. A tong construction comprising:
- a one-piece blade including blade portions connected by a hinge portion normally urging the blade portions to positions in which they lie in the same plane but permitting movement thereof to generally coextensive positions in which opposite ends thereof are engaging each other; and

keeper means on said blade portions for preventing movement of said blade portions to said positions in which they



lie in the same plane of each other but permitting movement of said blade portions to said engaging positions.

3,934,916

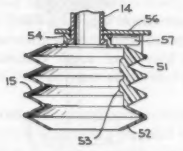
VACUUM PICKUP CUP

Thomas R. Baker, Redwood City, Calif., assignor to Kliklok Corporation, Greenwich, Conn.

Division of Ser. No. 436,612, Jan. 25, 1974. This application Dec. 3, 1974, Ser. No. 529,225

Int. Cl.² B66C *1/02*

U.S. Cl. 294—64 R **5 Claims**



1. A vacuum pickup cup for transferring and positioning an article comprising a collapsible body terminating in a lip means forming a vacuum opening, integral stiffening means on one side of said body to resist collapse, the opposite side being substantially free to collapse, said body being laterally flexible during both relaxation and collapse of said body, said body except for said lip means remaining free of said article, whereby said cup and substantially the entire article tilt toward the side free to collapse when vacuum is applied thereto while remaining subject to outside accommodating force and substantially the entire article is picked up.

3,934,917

CLAMSHELL BUCKET APPARATUS

Curtis L. Paxton, and Percy J. Gray, both of Pearland, Tex., assignors to McGinnes Manufacturing Company, Pearland, Tex.

Filed Dec. 10, 1973, Ser. No. 423,496

Int. Cl.² B66C *3/10*

U.S. Cl. 294—70 **18 Claims**

1. A clamshell bucket apparatus, comprising:

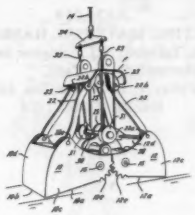
a pair of clamshell bucket sections each having a scoop configuration with laterally spaced inner edges which are adapted to contact each other in a substantially vertical position when the bucket is in its closed position for lifting a load and are adapted to be extended to a substantially horizontal position when the bucket is in its open position for picking up or dumping a load;

means including an upper frame for pivotally mounting said bucket sections together for pivotal movement to and from said open and closed positions;

operating and hoisting means operably connected with said clamshell bucket sections for both manipulating said bucket sections to and from said closed and open positions and for raising and lowering said bucket sections, said operating and hoisting means including:

a single line system adapted to extend from the clamshell bucket apparatus to a crane or the like;

releasable latch means movably mounted with said bucket sections and automatically biased into the latching position when the bucket sections are open and the single line system is slackened off;



a movable latch-engaging means operably connected with said single line system for movement into engagement with said latch means for thereafter applying a force to said buckets to move same to the closed position by pulling upwardly on said single line system, and for movement out of engagement with said latch means for supporting the entire apparatus from said single line system with the bucket sections in the open position; and

means for automatically releasing said latch means from said latch-engaging means by slackening off on said single line system when the bucket sections are supported on the ground or the like.

3,934,918

JUNCTION FOR SHEET-LIKE MATERIAL LOAD LIFTING BAND WITH OVERLOAD INDICATOR

Heinz Kress, Holzen near Schwerte, and Heinz Heckmanns, Ennepetal-Buttenberg, both of Germany, assignors to Titan Verpackungssysteme GmbH, Schwelm, Germany

Filed Nov. 16, 1973, Ser. No. 416,353

Claims priority, application Germany, Nov. 21, 1972, 2256983

Int. Cl.² B66C *1/18*

U.S. Cl. 294—74 **5 Claims**

1. A re-usable load-lifting band for lifting of heavy loads, comprising a band having a main section and a pair of overlapping terminal sections which form with said main section a closed loop for lifting of loads having a weight up to a predetermined upper limit; connecting means connecting said terminal sections with one another against separation when said loop supports a load, said connecting means comprising interconnecting parts in said terminal sections and each including a plurality of slits and corresponding sheet portions extending from the general plane of the respective terminal section, each of the sheet portions of the respective terminal section cooperating with a pair of slits in the other terminal section to thereby prevent said separation of said terminal sections under load; and inter-engaging portions having angularly related

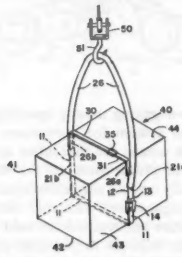
juxtaposed flange-like portions and juxtaposed openings receiving said flange - like portions on said terminal sections connecting the latter with each other and for retaining them from unintentional separation in the absence of said load, said flange-like portions being of plastically-deformable material which deforms upon the application of a load to said band and permanently visually indicates if the latter has been used to lift the loads having a weight in excess of said predetermined upper limit.

3,934,919

SELF-ERECTING MATERIAL HANDLING SLING

Arthur W. Smith, Trenton, N.J., assignor to TransTechnology Corporation, Sherman Oaks, Calif.

Filed May 7, 1974, Ser. No. 467,652
Int. Cl.² B66C 1/18
U.S. Cl. 294—74 16 Claims



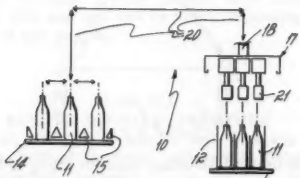
1. A material handling sling comprising an elongated, flexible securing member having a leading end and a terminal end, fluid inflatable means disposed intermediate the leading and terminal ends of the securing member, said inflatable means being adapted to increase the rigidity of the portions of the securing member with which it is in contact when said means are inflated with a fluid and thereby form a bowed or angular bail that projects outwardly from the load.

3,934,920

CARRIAGE FOR LIFTING AND SPREADING ROWS OF ARTICLES

Edward F. Rowekamp, Cincinnati, Ohio, assignor to The Lodge & Shipley Company, Cincinnati, Ohio

Filed July 8, 1974, Ser. No. 486,409
Int. Cl.² B66C 1/10
U.S. Cl. 294—87 R 3 Claims



1. A lifting carriage for plural patterns of articles comprising,

an elongated channel-shaped shroud including a flat top plate and depending lateral flanges,

a plurality of transverse rods supported between said flanges,

a plurality of elongated manifolds slidably mounted on said rods for lateral movement, each manifold having plural sets of grippers, each set of grippers on a manifold being spaced longitudinally from the adjacent set and aligned transversely with grippers on adjacent manifolds to provide plural patterns of grippers longitudinally spaced along said shroud,

each said manifold having two upwardly projecting pins,

said top plate having a transverse slot receiving each said pin,

two cam plates mounted for longitudinal movement on said shroud and having angulated cam slots receiving said pins to effect lateral movement of said manifolds upon longitudinal movement of said cam plate,

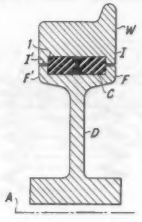
a longitudinally oriented piston and cylinder mounted on said shroud and connected to each said cam plate to thrust said cam plate longitudinally in one direction to spread said manifolds, and in other direction to retract said manifolds.

3,934,921

BUFFER FOR SPRING-SUPPORTED WHEELS

Ewald Nelken, Mulheim, Germany, assignor to Fried. Krupp Huttenwerke AG, Bochum, Germany

Filed Sept. 21, 1973, Ser. No. 399,442
Claims priority, application Germany, May 12, 1973, 2324060
Int. Cl.² B60B 17/00
U.S. Cl. 295—1 5 Claims

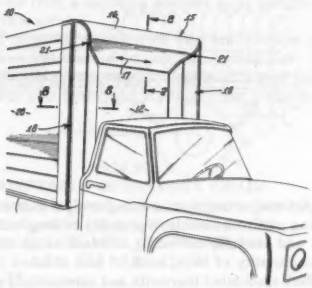


1. In a wheel for having an electrical current passing therethrough for use on an electrical vehicle, the wheel comprising a center-disc, a wheel-rim circumposed about said center-disc, said center-disc and wheel-rim including means forming an annular channel between the respective outer and inner peripheries of the center-disc and wheel-rim, elastic buffer means disposed between said center-disc and the wheel-rim and including electrical, current-conducting means for forming an electrical circuit between said center-disc and wheel-rim, the improvement in which the buffer means comprises a buffer element of an elastic material which is clamped at opposite sides in said annular channel, said annular channel being limited by portions of the center-disc and the wheel-rim, the opposite sides of the buffer element abutting respective portions of the center-disc and the wheel-rim and connecting the center-disc and wheel-rim to each other in cushioned relationship, said buffer element including a radially-extending channel extending through the opposite sides of the buffer element, a flexible electrical conductor extending through the radially-extending channel, said buffer element including opposed recesses in the opposite sides of the buffer element and communicating with the radially extending channel, electrical contact elements disposed in the opposed recesses of the buffer element, each contact element comprising a contact plate, the flexible electrical conductor terminating at opposite ends in a rivet head disposed beneath the contact plate in the opposed recesses and operatively connected to the contact plate, the rivet head being integral with the ends of the conductor, the contact plate covering the respective rivet head and being fixedly secured in a respective recess of the buffer element and protecting the rivet head from being sheared off while being compressed into contact with the center-disc and wheel-rim for insuring current transmittal.

3,934,922
AERODYNAMIC DRAG REDUCTION DEVICES FOR SURFACE VEHICLES

Paul B MacCready, Jr., and Peter B. S. Lissaman, both of Pasadena, Calif., assignors to Aerovironment Inc., Pasadena, Calif.

Filed Sept. 5, 1974, Ser. No. 503,290
Int. Cl.² B62D 35/00
U.S. Cl. 296—1 S 15 Claims



1. In combination,

a. a vehicle body having an exterior front wall, an exterior side wall and an exterior top wall, said side wall meeting said front wall at a vertical corner, and said top wall meeting said front wall at a horizontal corner,

b. means for preventing, reducing, or delaying separation of the flow boundary layer from said side and top walls rearwardly of said corners at normal operating speeds of the vehicle,

c. said means comprising two cooperating elongated protrusions respectively extending parallel to said two corners, each protrusion having a substantially smooth, arcuate outer surface projecting smoothly outwardly of said front wall, said protrusion surface having first elongated extent merging toward said front wall at a shallow angle therefrom and in a generally transverse direction extending away from the corner paralleling that protrusion and terminally joined to and extending along said front wall in spaced relation to said corner such that the first elongated extent substantially merges with the front wall, and second elongated extent merging generally toward said corner and terminally joined to and extending along said body proximate said corner such that the second elongated extent substantially merges with a body wall proximate said corner whereby each corner is enveloped by one protrusion,

d. said two protrusions extending generally perpendicular toward one another and mating proximate the intersection of said corners.

3,934,923
AIR DECELERATOR FOR TRUCK CAB

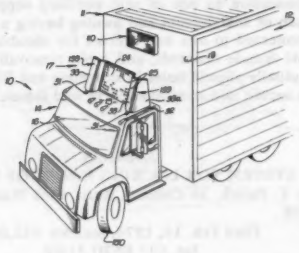
Peter B. S. Lissaman, Pasadena, and Jack H. Lamble, Anaheim, both of Calif., assignors to Aerovironment Inc., Pasadena, Calif.

Filed Mar. 7, 1975, Ser. No. 556,210
Int. Cl.² B62D 35/00
U.S. Cl. 296—1 S 18 Claims

1. For combination with a truck having a cab and a body rearwardly of the cab, drag reducing means comprising

a. porous structure including an upright plate adapted to be mounted on the truck to project above the cab roof and extend laterally, so as to be presented forwardly toward oncoming relative airflow for passing air rearwardly therethrough toward the front of said body, with accompanying air energy reduction and deceleration relative to the truck, said plate defining multiple through openings presented forwardly and distributed widely both vertically and laterally over the plate area, and

b. air flow directing means at laterally opposite ends of said structure and integral therewith for directing oncoming relative airflow laterally around said ends, said airflow directing means defining non-porous solid surfaces which

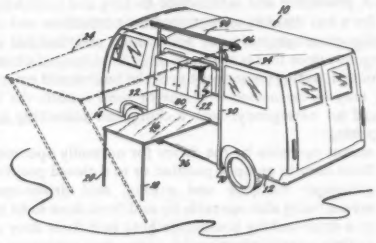


are generally vertically elongated and substantially coextensive in height with said upright plate and project with forward convexity forwardly of a plane defined by the plate front face, said surfaces also extending rearwardly of said plane at the lateral boundaries of said airflow directing means.

3,934,924
CAMPING APPARATUS FOR VAN-TYPE VEHICLE

Joseph Diliberti, 9608 Easter Way, San Diego, Calif. 92131

Filed Oct. 24, 1974, Ser. No. 517,731
Int. Cl.² B60P 3/32
U.S. Cl. 296—23 R 2 Claims



1. For use with a vehicle, a camping assembly which comprises:

a pair of main support members removably connected vertically to a side of the vehicle, in a spaced parallel relationship,

roof rain gutter attachment means for removably attaching said main support members to a roof rain gutter of the vehicle,

said roof rain gutter attachment means comprises a member projecting from each of said main support members to a point spaced outwardly therefrom and above the roof rain gutter and sloping toward and laterally adjacent the roof rain gutter,

vice means connected to the laterally adjacent terminal end of said members for releasably locking said roof rain gutter in said vice means,

said vice means comprising a fixed arm depending from said member and engaging said roof rain gutter, and

an adjustable clamp member contoured similar to the contour of the roof rain gutter and adapted to grasp the roof rain gutter with substantial surface contiguity,

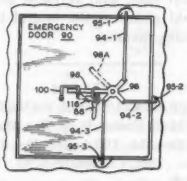
the lower extremity of each of said main support members being contoured for closely abutting a lower body part of the vehicle, whereby the main support members are tensionly assembled to the vehicle,

a plurality of horizontally extending auxiliary support members removably connected to said main support members, female channel members connected to said auxiliary support members, a cabinet and awning each adapted for connection to one of said auxiliary support members, each of said cabinet and awning having a male channel connected to one end thereof for slidable reception in said female channels, and a pin removably received in mutually aligned holes in said male and female channels to secure said male channel in said female channel.

3,934,925
SYSTEM FOR LOCKING DOORS OF BUSES

Joseph T. Fetsch, 26 Concord Road, Port Washington, N.Y. 11050

Filed Feb. 14, 1974, Ser. No. 442,508
Int. Cl.² B62D *31/02*
U.S. Cl. 296—28 A **10 Claims**



1. A protective and safety door-locking and unlocking system for a bus that has a front door for normal use and operation for passenger entrance and exiting and that has a rear emergency door that is normally to be kept latched closed but not locked, during passenger use of the bus, so said emergency door may be opened from inside or from outside the bus in case of an emergency; said locking and unlocking system comprising:

a. means operable by the driver for normally operating the front door to an open position or to a closed position, for passenger entrance and exiting; said driver-operable means being also operable by said front door to be moved to a door-locking position to hold said front door closed against unauthorized entry, during non-passenger use of the bus;

b. means independent of the normal driver-operable means for moving said driver-operable means from outside said bus, such that said driver-operable means is moved away from said door-locking position, to unlock said front door to provide access to the inside of the bus;

c. an ignition system switch lock;

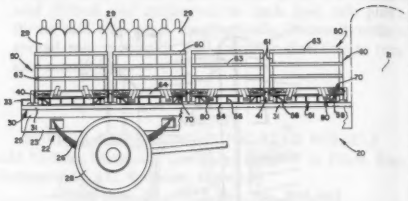
d. an ignition key for said ignition switch lock to control the ignition system of the bus;

e. means for locking said emergency door against unauthorized entry during non-passenger use of the bus, said emergency-door-locking means being mechanically connected to and serving as a carrier for said ignition key, thereby to require removal of the ignition key from the ignition switch lock to make available said means for locking said emergency door, and subsequently requiring unlocking of said emergency door to permit removal of said emergency door locking means plus said mechanically connected ignition key to make said ignition key then available to operate the ignition switch to start and operate the engine of the bus.

3,934,926
TRANSPORTING SYSTEM

Richard C. Bennett, 7333 Armitage Ave., Elmwood Park, Ill. 60635

Continuation of Ser. No. 375,689, July 2, 1973. This application Mar. 25, 1975, Ser. No. 561,929
Int. Cl.² B62D *23/00*
U.S. Cl. 296—35 A **13 Claims**

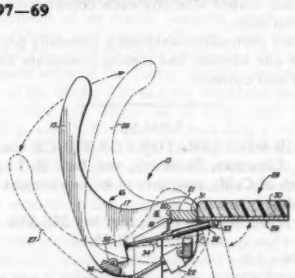


1. A transporting system comprising a load-supporting bed forming part of a vehicle, a plurality of longitudinally spaced-apart and laterally extending dividers which divide said bed into a plurality of bays, each of said dividers having keeper structure associated therewith and substantially perpendicular thereto, a plurality of article carriers arranged to be carried by a loader-unloader respectively into and out of said bays, a pair of bolts on each of said article carriers and mounted thereon for reciprocal movement between latching conditions engaging the associated keeper structure and unlatching conditions disengaging said keeper structure, a pair of biasing means on each of said article carriers respectively for urging the associated bolts to the latching conditions thereof, and a pair of actuating means on each of said article carriers respectively operatively coupled to said bolts for individual movement thereof between the latching and unlatching conditions, said actuating means being arranged to be automatically engaged respectively by forks of a loader-unloader when the associated article carrier is carried thereby to move the associated bolt against the action of the associated biasing means to the unlatching condition thereof and thereby enable an article carrier to be placed in or removed from a chosen bay.

3,934,927
POWERED TILTING LOUNGER

Henry Chanoch Zur, Tel Aviv, Israel, assignor to Arizona Lounger Company, Phoenix, Ariz.

Filed Oct. 29, 1974, Ser. No. 518,521
Int. Cl.² A47C *1/02*
U.S. Cl. 297—69 **8 Claims**



1. In a lounger,

a. supporting structure including a base adapted to rest on a floor and a pedestal upstanding from said base;

b. a structural assembly identified as a body supporting member for receiving the body of an occupant and com-

prising a rigid backing including a back portion, a seat portion, and a bend between and connectiing said back and seat portions, and a resilient pad covering the back and seat portions and the bend of said rigid backing;

c. means for pivotally mounting said body supporting member on said pedestal at the upper end thereof and on a horizontal axis extending through said seat portion in the forward upper region thereof;

d. power means for tilting said body supporting member on said pivotal mounting whereby the body supporting member is moved from a reclining position to an upright position and vice versa;

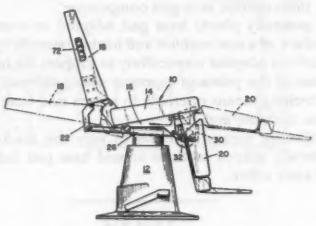
e. a leg rest pivotally mounted on said seat portion at the forward free end thereof and on a horizontal axis, and,

f. an independent power means for swinging said leg rest into and out of a horizontal leg supporting position.

3,934,928
ADJUSTABLE OPERATORY CHAIR

Philip C. Johnson, Cincinnati, Ohio, assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Dec. 27, 1973, Ser. No. 428,950
Int. Cl.² A61G *15/00*
U.S. Cl. 297—71 **7 Claims**

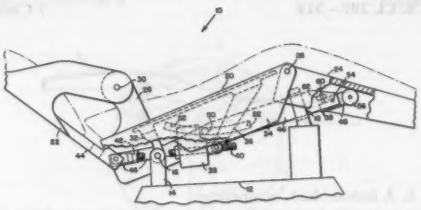


1. A chair including a seat, a back rest pivotally connected to said seat adjacent the rear edge thereof, power means comprising an electric motor mounted upon said chair, actuating means connected to said back rest and operable to move the same reversibly between normal substantially upright and rearwardly extending positions comprising opposite limits of movement thereof, reduction gear means connecting said actuating means to said motor for operation thereby, a worm and worm gear driven by said reduction gear means, and a shaft rotated by said worm gear for no more than one revolution during the full movement of said back rest between said substantially upright and rearwardly extending positions, in combination with an electrical control circuit for said motor comprising a plurality of limit switch means, said electric circuit being connected between said limit switch means and motor and a source of current and said switch means being operable to de-energize said motor when said back rest reaches either the normal upright or rearwardly extending limits of movement thereof, an adjustable program switch connected in said circuit, and an operator for said program switch adjustably carried by said shaft which is driven by said worm and worm gear and is operable during the actuation of said motor while moving said back rest toward said rearwardly extending limit position to de-energize said motor and thereby stop movement of said back rest prior to the same reaching said normal rearward limit of movement thereof.

3,934,929
ADJUSTABLE DENTAL CHAIR

Azriel Jay Rabinowitz, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,446
Int. Cl.² A47C *1/06*; A61G *15/00*
U.S. Cl. 297—75 **6 Claims**



1. A dental chair comprising:

a. pivotally connected back, seat and footrest sections;

b. a base having a rearward portion pivotally supporting said seatrest section and a forward guide portion;

c. motor means carried by said seatrest section and operatively connected to said backrest section for articulating said backrest relative to said seatrest;

d. a linearly movable link connected to said backrest and extending through said guide portion to contact said footrest section for articulating said footrest responsive to movement of said backrest; and

e. cam means connecting said link and seatrest section for articulating said seatrest about said rearward portion responsive to movement of said backrest.

3,934,930
BACK SUPPORT FOR CHAIR

Edwin C. Sandham, Thiensville, Wis., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Nov. 7, 1974, Ser. No. 521,940
Int. Cl.² A47C *7/44*
U.S. Cl. 297—291 **9 Claims**

1. A back support for a chair which includes a back pad comprising, in combination:

an elongated resilient block attached to the back pad;

a clip in part disposed between said block and said back pad;

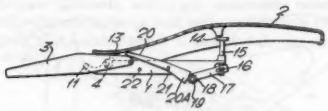
a locking element integrally formed on said clip,

a support member including a pocket disposed therein, said pocket being shaped to receive said block and said clip, a portion of said pocket cooperating with said locking element of said clip when said block and clip are inserted therein to resiliently urge said locking element to a locked position wherein the back pad is connected to said support member for pivotal movement relative thereto.

3,934,931
DENTAL CHAIR

Takahiro Matsui, and Osamu Uwamori, both of Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Apr. 5, 1974, Ser. No. 458,223
Claims priority, application Japan, Apr. 17, 1973, 48-43370
Int. Cl.² A61G 15/00; A47C 16/02
U.S. Cl. 297—319 7 Claims

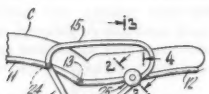


1. A dental chair, comprising:
a generally horizontally positioned seat having front and rear portions;
a back positioned adjacent said rear portion of said seat and movable to various inclines relative to said seat between a first, substantially upright, position and a second position below the horizontal;
first means for effecting inclination of said back between said first and second positions;
second means for pushing said front portion of said seat upward relative to said rear portion thereof; and
third means operable only in response to inclination of said back below a substantially horizontal position to drive said second means, resulting in said front portion of said seat being pushed upward relative to said rear portion thereof, such that the knees of a patient using the dental chair are raised above his waist.

3,934,932
ADJUSTABLE CHAIR

Jostein Ekornes, Ikornes, Norway, assignor to J.E. Ekornes Fabrikker A/S, Ikornes, Norway

Continuation-in-part of Ser. No. 193,430, Oct. 28, 1971, Pat. No. 3,773,383. This application Sept. 24, 1973, Ser. No. 400,446The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.
Int. Cl.² A47C 1/032
U.S. Cl. 297—320 5 Claims

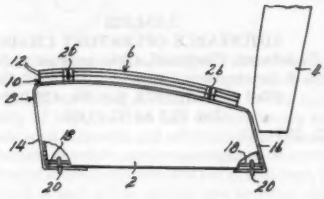


1. In an improved adjustable chair having a seat and back hingedly connected together and two supports, one at each side of said chair, such supports for use in adjusting the relative angular position of both said seat and said back to each other, each of such supports having a front and a rear portion, each of said rear support portions being pivotally connected to a side of said back, the improvement comprising two adjustable coupling units of the frictional variety, each unit being affixed to a separate side of the seat, and each unit being linearly slidable along one of said front support portions to allow the seat to move upwardly and forwardly and to move downwardly and backwardly for the adjustment of said angular position, each of said units being adjustable by frictional coupling to establish such an equilibrium position along said front supports that shifting of loading on said chair will move the seat and back relative to said supports to another position of similar equilibrium, the distance between the units and the axis about which the back and seat are hinged together being fixed, said coupling units being provided with opposed sections, defining surfaces therebetween for frictional engagement with and sliding movement along said front support portions, and means for moving said opposed sections towards and away from each other to vary the friction between said surfaces and said front support portion.

3,934,933
THERAPEUTIC SEAT PAD FOR AUTOMOBILES

Anthony J. Long, P.O. Box 697, Warsaw, Mo. 65355

Filed June 26, 1974, Ser. No. 483,302
Int. Cl.² A47C 3/00
U.S. Cl. 297—384 7 Claims



1. A thereapeutic seat pad comprising:
a. a generally planar base pad adapted to overlie the top surface of a seat cushion and having laterally spaced apart portions adapted respectively to support the left and right sides of the pelvis of a person sitting thereon,
b. attaching means operable to secure said base pad to said seat cushion, and
c. adjusting means operable to vary the thickness of the laterally spaced sections of said base pad independently of each other.

3,934,934
CHILD CAR SEATING APPARATUS AND METHOD FOR ASSEMBLING THE SAME

Claude S. Farrell, Jr., Worthington; Richard E. Cone, II, Kent, and Alan David Ellies, Columbus, all of Ohio, assignors to Buckeye International, Inc., Columbus, Ohio

Filed July 2, 1974, Ser. No. 485,161
Int. Cl.² A47C 13/00; A62B 35/00
U.S. Cl. 297—384 18 Claims

1. A child's car seat for protecting the child from infancy until the child is old enough to safely use an automobile seat, said child's seat comprising a molded unitary open-ended, outer shell which includes:
a substantially L-shaped center wall having a long portion terminating in a first rim at one end and having first infant-insert-receiving-and-positioning means associated therewith; a short portion joined at one end to said long

portion and terminating in a second rim at the other end and having second infant-insert-receiving-and-positioning means associated therewith;

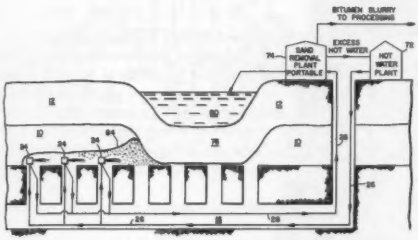
a pair of side walls, one along each side edge of the center wall and extending between said rims; and

said shell adapted to be positioned in a rear-facing infant-receiving postion wherein said long portion provides the bottom of the seat and the short portion provides the back of the seat and also adapted to be positioned in a front-facing toddler or child-receiving position wherein said short portion provides the bottom of the seat and the long portion provides the back of the seat.

3,934,935
HYDRAULIC MINING OF OIL BEARING FORMATION

Charles A. R. Lambly, Alamo, and Charles T. Draney, Hillsborough, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed Aug. 26, 1974, Ser. No. 500,796
Int. Cl.² E21C 45/00
U.S. Cl. 299—2 16 Claims



1. A method of mining material from oil bearing formations, such as tar sands, wherein said formation is between an overburden of an overlying rock and soil formation and an underlying impervious stratum, by subjecting said formation to high velocity fluid jet streams capable of forming a slurry of said material; and wherein a plurality of spaced-apart tunnels are formed through said impervious stratum adjacent to and below said formation, which comprises:

boring upwardly from said tunnels into said formation, a plurality of spaced-apart rows of channels, wherein said rows are spaced apart at a distance less than the effective distance of said jet stream for forming slurry from said material;

from a first row of channels, directing into said formation material, high velocity rotating fluid jet streams to form a slurry of said formation material in the jet stream path, wherein the effective distance of adjacent jet streams overlap, so as to form a row of interconnecting cavities;

directing said jet streams toward material from areas adjacent to said cavities, so as to continually enlarge said interconnected row of cavities to define a chamber, while initiating rotating jet streams from the next adjacent row of channels, so as to form a receding chamber moving towards said next row of channels, until said formation material and said overburden above a portion of said chamber is no longer supported and caves into a portion of said chamber;

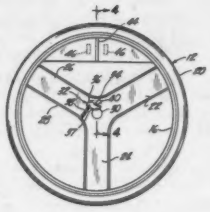
continuously removing slurry from said cavities for further processing; and

repeating said process from successive rows of channels.

3,934,936
AUXILIARY WHEEL FOR VEHICLES

Maynard W. Fine, 7187 Stonebrook, West Bloomfield, Mich. 48013

Continuation-in-part of Ser. No. 351,961, April 17, 1973, Pat. No. 3,866,978. This application Aug. 13, 1974, Ser. No. 496,966
Int. Cl.² B60C 17/04
U.S. Cl. 301—38 S 7 Claims



1. An auxiliary wheel for use with a conventional pneumatic tired vehicle wheel when the pneumatic tire carried by the rim of the conventional wheel is inoperative, said auxiliary wheel comprising;

a circular rim member having an outer diameter greater than that of the rim of said conventional wheel;

a tire carried on the outer peripheral surface of said rim member;

structural support means interconnecting portions of the inner periphery of said rim member;

a coupling member having means for releasably attaching said coupling member to said wheel rim;

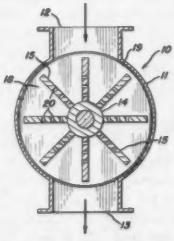
means pivotally connecting said coupling member to said circular rim member, said rim member being in a non-coaxial position with respect to said wheel rim when said coupling member is attached thereto, said rim member being movable from said non-coaxial position to a coaxial position with respect to said wheel rim when said wheel is rotated a limited distance; and

a locking means for lockingly engaging said rim member to said coupling member to maintain said rim member in said coaxial position.

3,934,937
NEW ROTARY VALVE

Liong S. Tee, Westmont, Ill.; Carlo Piazza, deceased, late of Naperville, Ill., and by Judith B. Piazza, executrix, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Sept. 27, 1971, Ser. No. 183,961
Int. Cl.² B65G 53/46
U.S. Cl. 302—14 2 Claims



1. In combination with a rotary valve for metering solid-liquid slurries wherein said valve comprises an enclosed housing provided with entry and exit ports and a rotor contained and

rotatable within said housing, said rotor being made up of 4 to 10 blades extending outwardly from along a portion of a drive shaft, said portion passing throughout the housing, towards the inside surface of said housing and said blades extending laterally towards left and right side walls, said walls providing left and right side enclosures for pockets formed by adjacent blades, wherein the improvement comprises:

screening means in the surfaces of said blades to permit the liquid of the solid-liquid slurry to flow rapidly from one pocket to an adjacent pocket and to retain the solids of the solid-liquid slurry so that such solids in one such pocket are trapped in such pocket until discharged through said exit port; and

said blades extending towards the inside surface of said housing and extending laterally towards left and right side walls, but not touching or sealing against the surface of said hosuing or said side walls and leaving a clearance between the blades and said inside surface of said housing and said side walls to prevent the solids of the solid-liquid slurry from being subjected to damaging shearing forces between the blades and said inside surface of said housing and said side walls and to prevent plugging of said entry port with solids of the solid-liquid slurry.

3,934,938

METHOD, CIRCUIT, AND APPARATUS FOR ANTI-SKID BRAKE CONTROL IN MOTOR VEHICLES

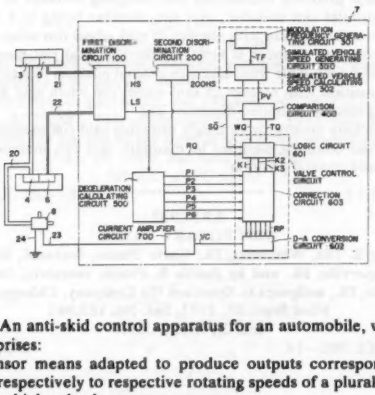
Kazutaka Kuwana, Toyota, and Hiroyuki Amano, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed July 17, 1973, Ser. No. 380,096

Claims priority, application Japan, July 20, 1972, 47-72722; Sept. 28, 1972, 47-97419; Sept. 28, 1972, 47-97420

Int. Cl.[2] B60T *8/10*

U.S. Cl. 303—21 P **2 Claims**



1. An anti-skid control apparatus for an automobile, which comprises:

sensor means adapted to produce outputs corresponding respectively to respective rotating speeds of a plurality of vehicle wheels;

a simulative vehicle speed generating circuit adapted to detect simulatively the wheel speed from the outputs of said sensor means thereby to produce a simulative vehicle signal;

a wheel speed detecting circuit adapted to derive a wheel speed signal of a wheel to be controlled from said outputs of said sensor means;

a deceleration counting circuit adapted to count the decelerated speed of the wheel to be controlled;

a comparing logical circuit adapted to compare said simulative vehicle signal with said wheel speed signal thereby to calculate the slip ratio and to discriminate whether or not said slip ratio is within the range of a predetermined slip of 20 to 60%;

a correcting deceleration circuit adapted to correct the decelerated or accelerated speed obtained in response to the output of said logical circuit, said decelerated or accelerated speed being obtained by a calculating operation of said deceleration counting circuit; and

control means for controlling the braking hydraulic pressure of the wheel to be controlled in response to the output of said correcting deceleration circuit when said wheel slip ratio is outside the predetermined range of the slip.

3,934,939

BRAKING PRESSURE REGULATING DEVICE FOR A VEHICLE BRAKING SYSTEM

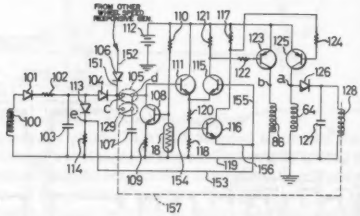
Takashi Hida, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 246,752, April 24, 1972, abandoned. This application Apr. 12, 1974, Ser. No. 460,618

Claims priority, application Japan, Apr. 23, 1971, 46-26904

Int. Cl.[2] B60T *8/10*

U.S. Cl. 303—21 A **8 Claims**



1. In a wheeled vehicle braking system of the type wherein braking pressure is applied to wheel cylinders of the vehicle wheels in response to pressure applied to a brake pedal and transmitted through a master cylinder, the improvement of a regulating device by which the braking pressure applied to the wheel cylinders is controlled in a fashion to ensure that the rate of reduction of the wheel speed corresponds to a deceleration rate set by the magnitude of the pressure applied to the brake pedal, said regulating device comprising:

sensor means for detecting the rotational speed of at least one wheel of said vehicle and developing a wheel speed-responsive voltage representative thereof;

memory means for storing said speed-responsive voltage, siad voltage being discharged in response to the application of braking pressure to said brake pedal;

proportioning means operatively connected through said master cylinder to said brake pedal for setting the rate of discharge of said voltage in response to the magnitude of braking pressure applied to said brake pedal;

comparator means for comparing said discharge voltage with said wheel speed-responsive voltage when said at least one wheel is being braked under said braking pressure; and

pressure increasing means including a cut-off means for interrupting communication between said master cylinder and said wheel cylinders, said pressure increasing means supplying a pressure of a magnitude greater than that of the master cylinder pressure to said wheel cylinder when said wheel speed-responsive voltage is higher than said variably responding discharge voltage, thereby decreasing said wheel speed and ensuring that the rate of reduction of said wheel speed corresponds to the rate set by the pressure applied to the braking pedal.

3,934,940

SAFETY INTERLOCK CIRCUIT FOR SWITCHING BRAKE ANTILOCK SYSTEMS IN A TRACTOR TRAILER VEHICLE COMBINATION IN AND OUT

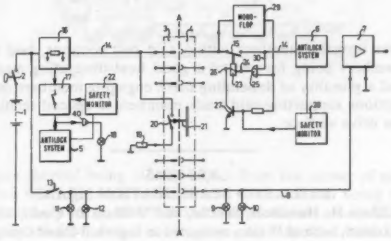
Eberhard Schnaibel, Hemmingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 23, 1974, Ser. No. 508,326

Claims priority, application Germany, Oct. 19, 1973, 2352496

Int. Cl.² B60T 8/02, 13/00

U.S. Cl. 303—21 R 8 Claims



1. A safety interlock circuit for the brake antilock systems of tractor-trailer vehicle combinations in which at least the tractor vehicle is provided with a brake antilock system, said circuit comprising:

connecting means (3) on the tractor vehicle for connecting a voltage supply line (14) from a voltage source (1) for supplying electric power to a brake antilock system of a trailer vehicle through a mating connector on said trailer vehicle;

current measuring means (16) comprising a resistor interposed in said voltage supply line (14) between said voltage source (1) and said connection means (3);

means comprising a threshold switch means (17) responsive to the voltage across said resistor for disabling a brake antilock system (5) in said tractor vehicle when the current in said current measuring means is below a predetermined value, and

warning means (18) connected to said disabling means for indicating when the brake antilock system (5) of said tractor vehicle is thereby disabled,

said threshold switch means being connected so as to disable said brake antilock system (5) of said tractor vehicle and to enable said warning means (18) in one position and to disable said warning means and to enable said brake antilock system of said tractor vehicle in the other position of said threshold switch.

3,934,941

SKID CONTROL VALVE

Lloyd H. Holmes, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Dec. 23, 1974, Ser. No. 535,994

Int. Cl.² B60T 8/12

U.S. Cl. 303—21 F 12 Claims

1. A valve apparatus comprising:

primary input channel means arranged for connection to a primary fluid source;

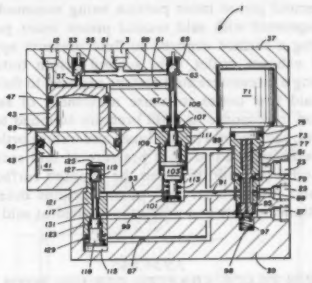
means defining a changeover cavity, said primary input channel means being connected to a first end of said changeover cavity;

primary output channel means connected to said first end of said changeover cavity, said primary output channel means being arranged for connection to a utilization device;

secondary input channel means arranged for connection to a secondary fluid source;

connecting channel means for connecting said secondary input channel means with a second end of said changeover cavity;

control means between said secondary fluid source and said second end of said changeover cavity, said control means being selectively operable to vary the effective pressure of said secondary fluid within said connecting channel means between said control means and said second end of said changeover cavity thereby providing pressure-controlled secondary fluid to said second end of said changeover cavity;



a first movable piston member in said changeover cavity; and

a second movable piston member in said changeover cavity separate from said first movable piston member, said first movable piston member being movable in response to the pressure exerted thereon by the primary fluid and said second movable piston member, said second movable piston member being movable in response to the pressure exerted thereon by the secondary fluid and said first movable piston member, each of said first and second movable piston members being in fluid contact with only one of said primary and secondary fluids.

3,934,942

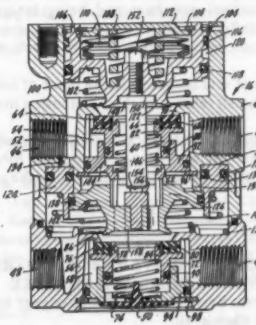
DUAL CIRCUIT BRAKE VALVE

Boleslaw Klimek, Des Plaines, Ill., assignor to The Berg Manufacturing Company, Des Plaines, Ill.

Filed July 22, 1974, Ser. No. 490,893

Int. Cl.² B60T 15/12

U.S. Cl. 303—52 14 Claims



1. A brake application valve including a housing having a first inlet and a first outlet, a second inlet and a second outlet and an exhaust outlet, a first shuttle in said housing normally closing communication between said first inlet and outlet, a second shuttle in said housing normally closing communication between said second inlet and outlet, said shuttles nor-

mally maintaining communication between said outlets and said exhaust outlet,

a first piston in said housing yieldingly urged away from said first shuttle, a second piston in said housing yieldingly urged away from said second shuttle, said second piston having inner and outer concentric portions, mechanical means carried by said first piston and positioned to cause said second piston inner portion to follow inward movement of said first piston, inward movement of both pistons moving said first and second shuttles to open communication between said inlets and outlets and close communication to said exhaust outlet,

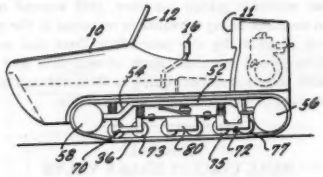
said second piston inner portion being mounted in sliding engagement with said second piston outer portion and having a surface exposed to fluid pressure appearing at said exhaust outlet, said second piston outer portion having a circumferential surface exposed to fluid pressure at said first outlet to cause movement of said second piston in response to fluid pressure supplied to said first outlet, said second piston inner and outer portions having surfaces exposed to fluid pressure at said second outlet whereby the ratio between the exposed surfaces of said second piston inner and outer portions determine the relationship between pressures applied at said outlets.

3,934,943

ENDLESS TRACK ADAPTED FOR USE WITH TRACK LAYING VEHICLES

Rodney E. Gage, 9815 Lemona Ave., Sepulveda, Calif. 91343

Filed Mar. 29, 1974, Ser. No. 456,320
Int. Cl.[2] B62D *55/24*
U.S. Cl. 305—35 EB **8 Claims**



1. A track member for an endless track vehicle comprising:

a plurality of transversely spaced longitudinal members and longitudinally spaced transverse members intersecting said longitudinal members and being integrally joined thereto to define a sheet-like grid with the spaces between said members defining openings completely through said grid;

the thickness of said members in the place of said sheet-like grid being small relative to their dimension normal to said plane;

said grid being of elastomeric material whereby said grid may be bent, in said plane, to arcuate form to effect steering of the vehicle without distorting the plane of said grid.

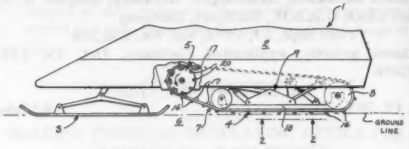
3,934,944

GROUND ENGAGING DRIVE TRACK APPARATUS FOR SNOWMOBILES AND THE LIKE

Lyle M. Forsgren, Fond Du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 27, 1974, Ser. No. 510,062
Int. Cl.[2] B62D *55/08*
U.S. Cl. 305—38 **15 Claims**

1. A drive track assembly for driving a vehicle over a support surface comprising an endless drive track means including a drive run and a return run with an internal suspension system urging the drive run into drive engagment with the support surface, said track means comprising a plurality of laterally spaced belt sections, a plurality of longitudinally spaced and laterally extending track members secured to the outer surface of said spaced sections and defining exposed



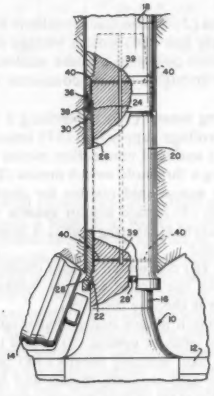
heat transfer members within said belt sections, said track members being formed of a good heat dissipating material, and a plurality of depending drive engaging members on said sections supporting said track members in spaced relation to the drive surface.

3,934,945

DRILL ROD STABILIZATION MEANS

William H. Hamilton, Seattle, and William D. Coski, Mercer Island, both of Wash., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 3, 1974, Ser. No. 511,640
Int. Cl.[2] F16C *1/26*
U.S. Cl. 308—4 A **14 Claims**



1. For use with an earth boring machine having a rotatable and earth penetrating drill rod, means for stabilizing the drill rod during rotation and earth penetration, comprising:

means for coupling thereof to drill rod, for interpositioning between the earth and drill rod, for engaging the earth;

said earth engaging means having means for receiving a bearing means interpositionally between said earth engaging means and drill rod for accommodating relative rotation between said earth engaging means and drill rod.

3,934,946

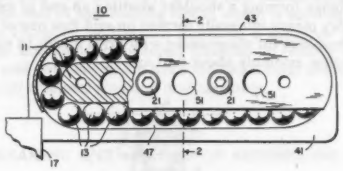
RECIRCULATING BALL SLIDE

John Kelsey Burr, Shrewsbury, and William Wolf, Eatontown, both of N.J., assignors to Motion Systems, Inc., Shrewsbury, N.J.

Filed Oct. 5, 1973, Ser. No. 404,018
Int. Cl.[2] F16C *17/00*
U.S. Cl. 308—6 C **1 Claim**

1. In combination, a ball slide and a slide rail, said ball slide comprising:

a recirculating ball race;
a plurality of ball bearings; and
means for retaining said ball bearings within said ball race, said ball slide and slide rail both including a concave ball track, at least the ball track in said ball race having an average radius of curvature less than 10 percent larger than the radius of said ball bearings, the center of curvature thereof being radially offset from the center of said ball bearings, said ball slide and said slide rail being respectively secured to first and second members which are adapted for relative movement with respect to one another, said slide rail and/or said ball slide being secured to their respective members by means of rotatable, eccentric machine screws.



3,934,947

FLUID BEARING SYSTEM

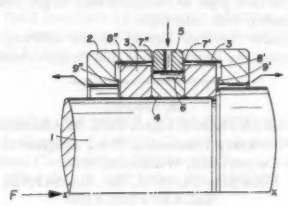
Lothar Walter, Schweinfurt, and Rainer Schürger, Arnstein, both of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Oct. 25, 1973, Ser. No. 409,704

Claims priority, application Germany, Oct. 26, 1972, 2252495

Int. Cl.² F16C *32/06*

U.S. Cl. 308—9 **1 Claim**



1. A fluid bearing for a shaft comprising an annular housing located about said shaft, said housing and said shaft defining at least one fluid compression pocket distributed about the periphery of said shaft, an inlet for the supply of fluid under pressure to said compression pocket and control means for regulating the flow of pressure to and from said pocket comprising an annular recess formed in said housing, a pair of spaced disks integrally formed with shaft and extending radially outward into said recess, an annular ring integrally formed with said housing and extending radially inward between said spaced disks, the axially opposing surfaces of said ring and said disks forming restrictor inlet openings and the axially opposing surfaces of said disk and said housing forming discharge openings, said restrictor inlet and discharge openings being simultaneously varied relative to each other in the opposite direction as a function of the size and distribution of the load thereon.

3,934,948

SELF-PRESSURIZING AND SELF-COMPENSATING HYDROSTATIC BEARING

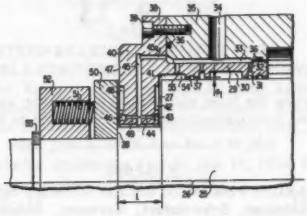
Francois Claude Pruvot, Pully (VD), Switzerland, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed July 9, 1974, Ser. No. 486,934

Claims priority, application France, July 20, 1973, 73.26826

Int. Cl.² F16C *1/24, 7/04, 33/72, 37/00*

U.S. Cl. 308—9 **12 Claims**



1. A self-pressurizing hydrostatic bearing intended to support a rotating shaft, comprising:
a bearing element including a plurality of pockets each of which is respectively pressurized, in response to the rotation of said shaft relative to said bearing element, by means of a fluid supply channel;
said pockets and channels being bounded and defined by means of sealing lands integral with said bearing element, said lands extending to within a very short distance from said shaft so as to define a gap therebetween; and
wherein said bearing element is deformable radially outwardly under the influence of said pressure within said pockets,
whereby said gap defined between said lands and said shaft increases as said pressure increases in response to the increasing rate of rotation of said shaft so as to permit the temperature rise of the fluid leaving said bearing, as said speed increases, to be substantially nullified.

3,934,949

METHOD FOR REDUCING ROTATION COMPONENTS IN TABLE TRANSLATION

Kevin James Brady, Murray Hill; Victor Andrew Firtion, Secaucus; Leif Rongved, Summit, and Thomas Edward Saunders, Basking Ridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

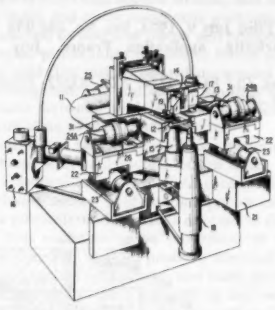
Division of Ser. No. 429,037, Dec. 27, 1973. This application Apr. 16, 1975, Ser. No. 568,523

Int. Cl.² F16C *35/00*

U.S. Cl. 308—9 **2 Claims**

1. A method for translating a semiconductor wafer along a straight line with great precision comprising the steps of:
determining the movement curvature a_1 of a first reciprocating air bearing;
determining the movement curvature a_2 of a second reciprocating air bearing;
fastening the first and second bearings to a table such that

they lie along a common axis and such that the angle a_1 extends in the same direction as that of the angle a_2;



supporting the table with a third air bearing; and

applying a reciprocating translational force to the table.

3,934,950

BEARING FOR HIGH SPEED ROTARY SHAFTS

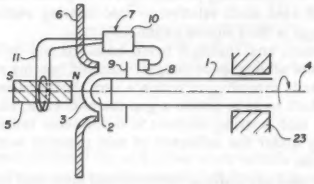
Wolf Kuhlmann, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Oct. 3, 1973, Ser. No. 403,330

Claims priority, application Germany, Oct. 4, 1972, 2248695

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **16 Claims**



1. A system for journalling high speed rotary shafts comprising a spherical cap bearing fixedly mounted with respect to the shaft adapted to receive an end of said shaft, and to support said shaft against axial movement in the direction of said bearing, magnetic means arrayed with respect to said cap bearing to exert a continual force axially on said shaft toward the bearing means associated with said shaft cooperative with said magnetic means to move said shaft toward said spherical cap bearing during rotation and said cap bearing formed with at least one groove on its surface for forming a dynamic bearing film between the cap bearing and the shaft during rotation of said shaft.

3,934,951

SYSTEM OF CONSTRUCTION COMPONENTS FOR THE PRODUCTION OF ROLLER ASSEMBLIES

Karl Stumpf, Goethestrasse 1, 4 Dusseldorf, Germany

Filed Feb. 21, 1975, Ser. No. 551,830

Claims priority, application Germany, Mar. 30, 1974, 7411241[U]

Int. Cl.² F16C *13/00*, *35/00*; B65G *13/00*

U.S. Cl. 308—20 **3 Claims**

1. A roller assembly for a roller train comprising

a fixed cylindrical axle;

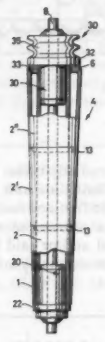
a roller pipe having cylindrical inner and outer surfaces;

first and second end members each having bearing means therein, said members being slidable onto said axle for rotation thereon, each of said end members having

a hub extending into and frictionally engaging the interior surface of said pipe, and

a flange having a larger outer diameter than said hub, said flange forming a shoulder abutting an end of said pipe;

pulley means integrally formed on said first one of said end members for cooperating with drive means to rotate said roller assembly about said axle;



a plurality of hollow frustoconical members slidable onto said pipe in end-to-end relationship surrounding said pipe and in coaxial relationship therewith, the outer surfaces of said frustoconical members making equal angles with the axes thereof, the smaller end of each said member being of equal diameter with the larger end of the next adjacent one of said members to form a continuous frustoconical outer surface along the length of said roller assembly; and an annular spacer member between the larger end of the largest one of said frustoconical members and said pipe to maintain said larger end in coaxial relationship with said pipe.

said spacer member having means defining a shoulder abutting the larger end of said largest member.

3,934,952

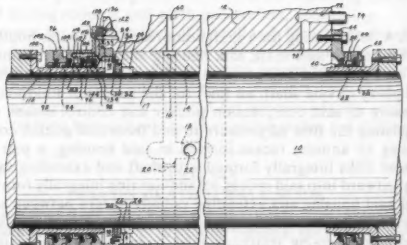
LEAKPROOF SEAL FOR BEARINGS

Willis W. Gardner, Waukesha, Wis., assignor to Waukesha Bearings Corporation, Waukesha, Wis.

Filed Jan. 24, 1975, Ser. No. 543,722

Int. Cl.² F16C *1/24*

U.S. Cl. 308—36.1 **16 Claims**



1. In a bearing and seal assembly wherein there is a rotatable shaft and a bearing sleeve surrounding a portion of said

shaft, there being oil openings in said bearing sleeve, and wherein there is means for applying oil under pressure to said oil openings to provide lubrication between said bearing sleeve and said shaft, and wherein there is a seal assembly surrounding said shaft axially spaced from said bearing sleeve, the improvement comprising means providing an annular collecting chamber around said shaft between said bearing sleeve and said seal assembly, a seal ring surrounding said shaft at the end of said bearing sleeve which is adjacent said collecting chamber, and means including a scavenge pump coupled to said annular collecting chamber to remove material from said chamber which has collected therein because of leakage past said seal ring and seal assembly.

3,934,953

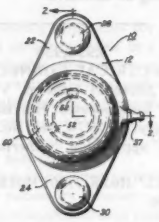
SHAFT BEARING AND METHOD OF ASSEMBLING THE SAME

Robert W. Tooley, Osceola, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed May 3, 1974, Ser. No. 466,604

Int. Cl.² F16C *9/06*; B21D *53/10*

U.S. Cl. 308—72 **13 Claims**



1. A shaft bearing comprising a housing having a body with a cavity therein, a bearing insert seating in said cavity for journalling a shaft, a retainer for seating on said body for securing said bearing insert in place in said housing, said body and said retainer being constructed of a plastic material joined together at their interface by ultrasonic vibration, forming an integral body retainer structure with the bearing insert entrapped in said body cavity.

3,934,954

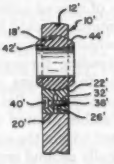
SPHERICAL BEARING WITH SLOTTED KEY

Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 9, 1974, Ser. No. 530,697

Int. Cl.² F16C *23/04*

U.S. Cl. 308—72 **1 Claim**



1. A spherical bearing comprising an outer member having a hole extending from side to side the surface of the hole being concave and spherical so that the outer member has constricted portions at each side, the outer member also having a walled keyway extending downward from the hole and extending axially from side to side of the outer member substantially perpendicular to the sides of the outer member; a walled key in the keyway co-extensive with the keyway, the key also having a concave and spherical top surface corresponding to the surface of the hole so that the key has shoulder portions corresponding to the constricted portions of the outer member; and a partially spherical inner member having flat sides, the inner member being held in the outer member by impingement of the spherical surface of the inner member against the constricted portions of the outer member and the key being held in the outer member by impingement of the shoulder portions of the key against the spherical surface of the inner member, the improvement comprising the provision of a radial extending slot in the walled key, adjusting means in the wall of the key to vary the width of the slot thereby varying the bearing tolerance between the inner and outer members, said radially extending slot is only partially through said key in a radial direction, said slot being open in the direction of said keyway.

3,934,955

FIXED BEARING ASSEMBLY FOR A TILTABLE-CONVERTER CARRYING TRUNNION

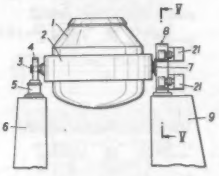
Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 2, 1975, Ser. No. 538,202

Claims priority, application Austria, Jan. 10, 1974, 167/74

Int. Cl.² F16C *23/06*

U.S. Cl. 308—72 **15 Claims**



1. A fixed bearing assembly for a tiltable-converter carrying trunnion which comprises:

a spur gear wheel secured to the carrying trunnion,

a base,

a common bearing and drive housing directly secured to the base and jointly accommodating the carrying trunnion and the spur gear wheel, and

a bearing means between the spur gear wheel and the housing for accommodating angular and wobbling movements of the carrying turnnion spur gear wheel.

3,934,956

AXIAL THRUST BEARING

Alfred Pitner, Paris, France, assignor to Nadella, France

Filed Mar. 19, 1974, Ser. No. 452,517

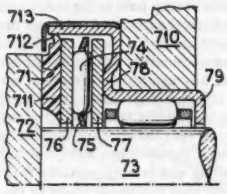
Claims priority, application France, Mar. 21, 1973, 73.10070

Int. Cl.² F16C *19/34*

U.S. Cl. 308—174 **21 Claims**

1. A thrust bearing comprising an annular support structure having means defining a radially inwardly extending retaining face at each end of the structure, at least one annular plate disposed within the support structure and defining a raceway, a ring arrangement of radial rolling elements in rolling contact with the raceway and a cage which guides the rolling elements, at least one axially deformable annular elastically yieldable means disposed within the support structure in freely axially movable relation to the support structure, and applied against in contact with the plate on a side of the plate remote from the

rolling elements, one of said retaining faces axially retainingly cooperating with the cage and the other retaining face axially

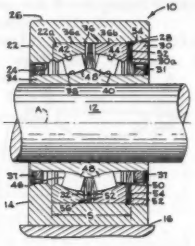


retaining the yieldable means, the rolling elements being uncovered for direct engagement with a machine part.

3,934,957
PRELOADED DOUBLE ROW SPHERICAL ROLLER BEARING

William J. Derner, Indianapolis, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 13, 1974, Ser. No. 442,023
Int. Cl.² F16C *23/00*
U.S. Cl. 308—207 A **3 Claims**



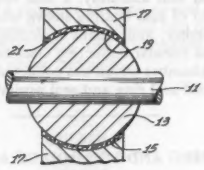
1. A double row antifriction bearing having a housing and having inner race means and outer race means, said bearing having two rows of rollers mounted between said inner race means and said outer race means, said outer race means comprising two spaced apart annular race members, said housing having two spaced apart opposing wall surfaces between which said two annular race members are received, at least one of said housing wall surfaces defined by a threaded nut adjustable toward and away from the opposite wall surface to adjust the span between said wall surfaces, the combination comprising a first wave spring between said outer race members and engaged with both to bias said race members apart, and a second wave spring between one of said race members and one of said housing wall surfaces, said spring engaged with both said one race member and said one housing wall surface to bias said members apart and thereby bias said other housing wall surface into engagement with said other race member.

3,934,958
BEARING LINER

Peter H. Turner, Burbank, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 274,606, July 24, 1972. This application Apr. 25, 1974, Ser. No. 463,885
Int. Cl.³ F16C *9/06*
U.S. Cl. 308—238 **20 Claims**

1. In combination:
a first member defined in part by a first surface;
a second member defined in part by a second surface disposed in proximity to the first surface of the first member, the second member having characteristics for movement with respect to the first member;
first means disposed in fixed relationship with one of the first and second surfaces and slidably engaging the other of the first and second surface to provide a low friction

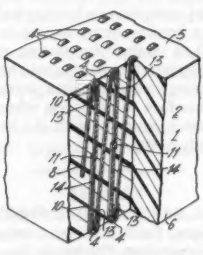


layer between the first and second surfaces, the first means including a fibrous material, the first means further including particles of a low friction material in a mechanically bonded relationship with the fibrous material and further including an adhesive.

3,934,959
ELECTRICAL CONNECTOR

Hermanus Petrus Johannes Gilissen, Vlijmen, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 22, 1974, Ser. No. 490,621
Claims priority, application Netherlands, Aug. 8, 1973, 7310941
Int. Cl.² H05K *1/00*; H01R *11/02*
U.S. Cl. 339—17 M **2 Claims**



1. A matrix connector comprising an elastomer body presenting a pair of opposite contact surfaces at each of which is disposed a multiplicity of spaced contacts, the contacts of the opposite faces being interconnected by conductors extending through the body, in which the contacts are defined by folds of the conductors extending through the elastomeric mass, convex portions of the folds being exposed at the opposite faces, said conductors comprise flat metal strips formed as circuits on a lamina flexible printed circuit folded in concertina fashion and encased within the elastomer body, the metal strips extending externally around respective concertina folds to define the contacts exposed at the contact surfaces of the elastomer body, the strips associated with alternate folds of the concertina form being disposed on one side of the printed circuit and the strips associated with the intervening folds being formed on the opposite side of the printed circuit, strips on one side of the circuit being connected with respective strips on the other side through holes in a flexible insulating lamina of the circuit at locations within the elastomer body inwards of the contact surfaces, and the elastomer extending through apertures in the insulating lamina.

3,934,960

ARRANGEMENT FOR DETACHABLY MOUNTING AN EXAMINING MEMBER ONTO A MICROSCOPE

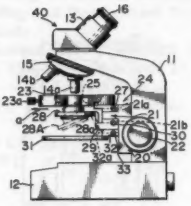
Teruo Ouchi, Hachioji, and Hiroshi Isuda, Mitaka, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1974, Ser. No. 517,487

Claims priority, application Japan, Dec. 15, 1973, 48-142334[U]

Int. Cl.² G02B 21/06

U.S. Cl. 350—87 9 Claims



1. Detachable mounting apparatus for use with a microscope having support means movable in a first plane towards and away from optical objective means, comprising:

a support member extended from said support means in a second plane substantially perpendicular to said first plane, said support member having a first dovetail joint portion formed on each of a pair of opposed surfaces extended in said second plane;

means for supporting a specimen to be examined;

a first examination accessory member;

each of said specimen support means and said first examination accessory member having a cooperating dovetail joint portion extended in said second plane and adapted to detachably closely mate with one of said first dovetail joint portions to independently rigidly position each of said specimen support means and said first examination accessory member to one of said pair of opposite support member surfaces and within the viewing cone of said optical objective means, whereby each of said specimen support means and said first examination accessory member is independently removable from said support member by sliding disengagement of said first and cooperating dovetail joint portions in said second plane without disturbing the position relative to said microscope and said movable support means of the other one of said specimen support means and first examination accessory member.

3,934,961

THREE LAYER ANTI-REFLECTION FILM

Susumu Itoh, Tokyo; Keijiro Nishida, Kanagawa; Osamu Kamiya, Tokyo, and Nobuyuki Sekimura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 192,394, Oct. 26, 1971, abandoned. This application Sept. 21, 1973, Ser. No. 399,612

Claims priority, application Japan, Oct. 29, 1970, 45-95438

Int. Cl.² G02B 5/28

U.S. Cl. 350—164 5 Claims

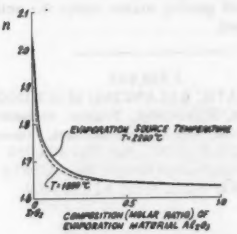
1. A three-layer anti-reflection coating deposited by vapor-deposition consisting of a first layer, a second layer and a third layer being positioned in the recited order from a glass base plate:

the first layer having an optical thickness of one-half the designed wavelength and being composed of aluminium oxide and zirconium oxide;

the second layer having an optical thickness of one-half the designed wavelength; and

the third layer having an optical thickness of one-fourth the designed wavelength,

wherein the relationship among the refractive indices of the glass base plate, the first layer, the second layer, and the third layer is



that the second layer > the glass base plate > the first layer > the third layer.

3,934,962

MECHANISMS FOR TRANSPORTING STRIP MATERIAL

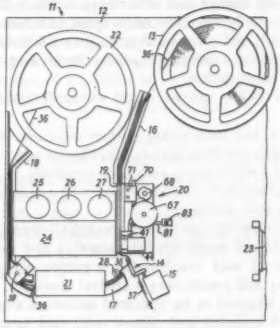
John Thurston Taylor; Anthony James Halliday; Jonathan George Cordy Angel, all of Peacehaven, and Bernard Blakemore, London, all of England, assignors to Colourvision Associates, London, England

Filed Feb. 8, 1974, Ser. No. 440,761

Claims priority, application United Kingdom, Feb. 12, 1973, 6735/73; Feb. 12, 1973, 6737/73

Int. Cl.² G03B 1/22

U.S. Cl. 352—194 7 Claims



1. An intermittent drive mechanism comprising:

face cam means mounted for rotation about an axis;

profile cam means mounted for rotation about the said axis;

said face cam means having a side face defining a cam groove;

first lever means arranged to be moved cyclically by rotation of said face cam means,

claw means provided on said first lever means;

cam groove follower means provided on said first lever means and extending parallel to said axle to engage said cam groove whereby to be positively guided to effect the cyclical movement of the first lever means on rotation of said face cam means;

second lever means arranged to be moved cyclically by rotation of said profile cam means and pivotally coupled to said first lever means whereby to impose the cyclical movement of said second lever means on said first lever means; and

strip guiding means arranged adjacent said claw means whereby said cyclical movements of said first and second lever means imposed upon said claw means drives said

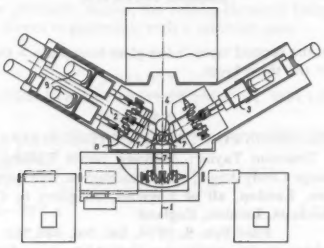
claw means in cyclical motion such that said claw means is engageable with and disengageable from perforated strip material in said guiding means under the action of said profile cam means, and intermittently transports said material in said guiding means under the action of said face cam means.

3,934,963

AUTOMATIC BALANCING MACHINES

Christian Langlois, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed Oct. 16, 1973, Ser. No. 406,934
Claims priority, application France, Nov. 2, 1972, 72.38988
Int. Cl.[2] B27C *9/00*; B23B *39/04*
U.S. Cl. 408—2 **1 Claim**



1. Automatic machine for balancing the rotary crankshaft of thermal engines comprising

a measuring station and machining stations disposed circumferentially equal distances apart on a common circle;

a rotary unit, said rotary unit having a work holding fork for each station extending radially from said rotary unit toward each station;

said forks being spaced equal circumferential distances apart;

means to rotate said rotary unit to angularly displace said forks from one station to another in the same direction of rotation and to move said fork vertically to receive the rotary crankshaft and to deliver said crankshafts to supports at said stations;

said machining stations having crankshaft supports comprising V-shaped members for receiving and centering the journals of said crankshafts, together with inserts for engaging and positioning a central crankpin, and

a bracket adapted to be operated automatically by a fluid-actuated cylinder and piston unit, said bracket further comprising shoes for clamping journals normally to said V-shaped members and a bevelled spring-urged piston end for pressing the reference crankpin against one of the positioning inserts to angularly orientate the crankshaft in the mounting.

3,934,964

GRAVITY-ACTUATED FLUID DISPLACEMENT POWER GENERATOR

David Diamond, 2773 Mill Ave., Brooklyn, N.Y. 11234

Filed Aug. 15, 1974, Ser. No. 497,533
Int. Cl.[3] B23B *39/00*
U.S. Cl. 415—7 **6 Claims**

1. A gravity-actuated power generator, comprising:

a. a first fluid medium;

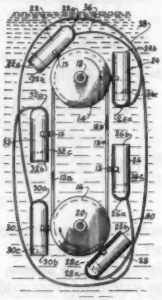
b. a plurality of containers, said containers being immersed in and having a variable buoyancy with respect to said first fluid medium;

c. rotating means, said rotating means being connected to and driven by said containers, and having at least one substantially horizontal axis of rotation; and

d. gravity-actuated pump means, said gravity-actuated pump means being connected to and controlling the buoyancy of said containers in accordance with the positions of said containers with respect to said axis of rotation;

e. whereby said containers positioned to move upwardly about said axis of rotation are lighter in weight, and said containers positioned to move downwardly about said axis of rotation are heavier in weight, relative to the weight of said first fluid medium displaced thereby;

f. such that said containers move by force of gravity and fluid displacement about said axis of rotation,



g. a second fluid medium, said second fluid medium being lighter than an equal volume of said first fluid medium and being contained within said containers; and

h. conduit means, said conduit means connecting between said containers positioned to move upwardly about said axis of rotation and said containers positioned to move downwardly about said axis of rotation, thereby forming opposite pairs of containers,

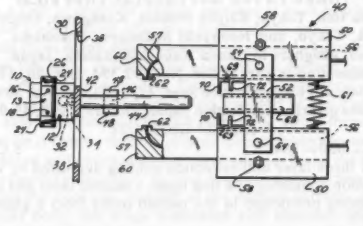
i. said gravity-actuated pump means being adapted to pump said second fluid medium from said containers positioned to move downwardly about said axis of rotation, through said conduit means to said containers positioned to move upwardly about said axis of rotation.

3,934,965

OPTICAL COUPLER

Donald F. Wiseman, Hackensack, and Roy C. Josephsen, Hillsdale, both of N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,677
Int. Cl.[2] G01N *1/10*
U.S. Cl. 356—246 **12 Claims**



1. In an optical coupling for a flowcell having an optical sight path and light-input and light-output windows along said sight path the combination of: a support for the flowcell, clamp means comprising a pair of jaw members having a pair of corresponding end portions and comprising means for movement of such end portions relatively toward and away from each other, at least a pair of light-transmitting elements

having terminals supported in the respective jaw members for alignment with said light-input and light-output windows, respectively, in the operative positions of said jaws, and slip-on coacting guide means on said clamp means and said support for aligning said light-transmitting elements along said optical sight path in the operative positions of said jaws.

3,934,966
COOLING WATER PUMP, PREFERABLY OF MOTOR CAR ENGINES

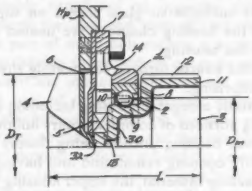
Sture Lennart Asberg, Savedalen, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Jutphass, Netherlands

Continuation-in-part of Ser. No. 304,905, Nov. 9, 1972, Pat. No. 3,861,170. This application June 21, 1974, Ser. No. 481,877

Claims priority, application Sweden, Nov. 11, 1971, 14399/71

Int. Cl.² F16C *1/06* F04D *29/22*

U.S. Cl. 415—219 C 9 Claims



1. A pump unit for liquid-cooled internal combustion engines preferably for vehicle engines and of the type including a pump unit housing, an impeller, a drive member operatively connected to the impeller to rotate the same forming a rotatable assembly, bearing means supporting the drive member for rotation relative to the housing and a seal adapted to seal an annular space between the rotatable assembly and housing characterized in that the pitch diameter D_m of the bearing and the axial length L of the pump unit as measured from the impeller to the oppositely located end of the drive member are of a relationship wherein D_m is between $1/\sqrt{3}$ and $\sqrt{3}$ L.

3,934,967
REFRIGERATION COMPRESSOR AND SYSTEM

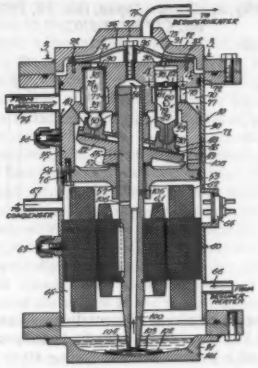
Edwin L. Gannaway, Adrian, Mich., assignor to Sundstrand Corporation, Rockford, Ill.

Filed July 12, 1973, Ser. No. 379,006

Int. Cl.² F04B *27/00*

U.S. Cl. 417—271 9 Claims

1. A refrigeration compressor, comprising,
a. a sealed housing,
b. a cylinder block in the housing having an annular array of parallel axially disposed cylinders around a central axis,
c. pistons reciprocable in the cylinders,
d. a cam inclined relative to the axis of the cylinder block,
e. means mounting the cam and the cylinder block for relative rotation to reciprocate the pistons in the cylinders,
f. means providing an annular inlet channel in the housing around the cylinder block,
g. an inlet in the housing leading to the annular channel,
h. intake valving for admitting low pressure fluid from the inlet channel to the cylinders on the intake strokes of the pistons,
i. an outlet leading from the housing,
j. an annular array of outlet ports in the cylinder block leading axially respectively from the cylinders to the outlet,
k. leaf valves associated with the outlet ports for discharging high pressure fluid from the cylinders to the outlet on the compression strokes of the pistons, and



l. a circular dish-shaped baffle having a central portion in spaced relation to the cylinder block and an outer periphery overlying and contiguous with the leaf valves and defining restricted passages between the leaf valves from the interior of the baffle to the outlet.

3,934,968
MOLD FOR MAKING DOUBLE-TOOTHED BELTS

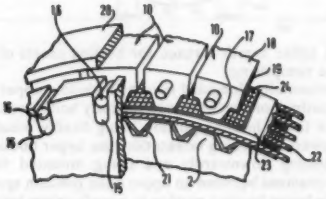
Mario Cicognani, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Mar. 4, 1975, Ser. No. 555,254

Claims priority, application Italy, Apr. 26, 1974, 21925/74

Int. Cl.² B29D *29/00*; B29H *7/22*

U.S. Cl. 425—28 B 4 Claims



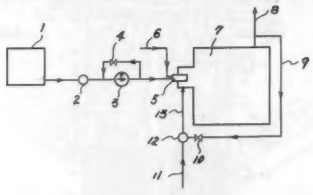
1. A mold for the manufacture of double-toothed belts comprising a mandrel provided with teeth on its outer surface, a plurality of shaped bars arranged around the toothed surface of the mandrel, said shaped bars having their surface directed towards the mandrel, each bar being shaped to form at least the groove of one tooth and two half teeth, and means for carrying out a guided movement, in a direction radial to the mandrel, of said shaped bars.

3,934,969

METHOD FOR BURNING EMULSION OILS

Hideyo Noda, Kyoto; Norio Kawai, Osaka; Osamu Tarue, Nagaokakyo; Kazuo Fukada, Takarazuka; Shigeyoshi Idehara, Akashi; Tadao Nakanishi, Osaka; Yuzo Kakimoto, Akashi, and Yoshito Nakamura, Ibaraki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 20, 1974, Ser. No. 534,793
Claims priority, application Japan, Dec. 22, 1973, 48-3904
Int. Cl.[2] F23J 5/02
U.S. Cl. 431—9 7 Claims



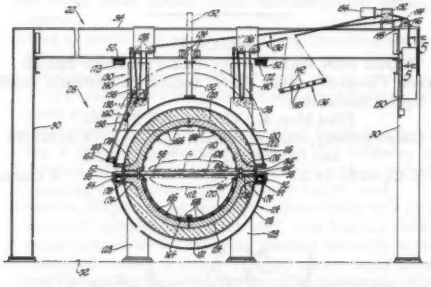
1. In burning an emulsion oil containing oil and water in a ratio of 5 – 9 : 5 – 1 by volume, a method characterized in that the emulsion oil is burned while recycling 10 to 40% by volume of the resulting combustion exhaust gas to a combustion chamber.

3,934,970

GLASS TEMPERING SYSTEM

Harold A. McMaster, 707 Riverside Drive, Woodville, Ohio 43469, and Norman C. Nitschke, 9102 Buck Road, Perrysburg, Ohio 43551

Filed Feb. 19, 1975, Ser. No. 551,435
Int. Cl.[2] F27B 9/00; C03B 25/04
U.S. Cl. 432—121 38 Claims



1. A roller hearth furnace for heating sheets of glass, the furnace comprising:

a horizontally elongated housing including upper and lower housing portions of complementary hollow constructions, the lower housing portion being fixedly mounted in an upwardly opening orientation, the upper housing portion opening downwardly and being mounted for vertical movement between an upper open position spaced above the lower housing portion to permit access into the housing portions and a lower closed position immediately over the lower housing portion so the housing portions cooperatively define a horizontally elongated heating chamber, said housing portions cooperatively defining horizontally elongated slots along the elongated sides thereof, said elongated slots opening horizontally in communication with the heating chamber and in alignment with each other, and means on the housing for heating the chamber thereof; and

a roller conveyor for moving sheets of glass through the heating chamber, said conveyor including means defining a pair of support surfaces respectively extending horizontally alongside the slots of the housing and located externally of the heating chamber, said support surfaces being at the same vertical height as each other, a pair of continuous drive belt means respectively slidable on the pair of support surfaces, said drive belt means having upwardly facing surfaces in horizontal alignment with the elongated housing slots and each other while sliding along the support surfaces, a plurality of elongated rollers extending through the heating chamber of the furnace and outwardly through the elongated slots in the housing, the opposite ends of each roller being supported on the upwardly facing surface of the adjacent drive belt means so the roller portions within the heating chamber support sheets of glass in a horizontal orientation, positioning means preventing the rollers from moving in the elongated direction of the furnace so that frictional engagement of the rollers with the drive belt means rotates the rollers as the belt means move along the support surfaces, and drive means for moving the belt means along the support surfaces so glass sheets on top of the rollers within the heating chamber are heated while conveyed within the housing.

10. A roller hearth furnace for heating sheets of glass, the furnace comprising:

a horizontally elongated housing including upper and lower housing portions of complementary hollow constructions, the lower housing portion being fixedly mounted in an upwardly opening orientation and having an inner layer of refractory material, the upper housing portion opening downwardly and having an inner layer of refractory material, the upper housing portion being mounted for vertical movement between an upper open position spaced above the lower housing portion to permit access into the housing portions and a lower closed position immediately over the lower housing portion so the inner layers of refractory material of the housing portions cooperatively define an elongated heating chamber of the furnace, said layers of refractory material cooperatively defining a pair of horizontally elongated slots along the elongated sides of the furnace, said elongated slots opening horizontally in communication with the heating chamber and in alignment with each other, and means for heating the heating chamber of the housing;

a roller conveyor for moving sheets of glass through the heating chamber of the furnace from one end thereof to the other, said conveyor including means defining a pair of support surfaces respectively extending horizontally alongside the slots of the housing and located externally of the heating chamber, said support surfaces being at the same vertical height as each other, a pair of continuous drive belts respectively associated with the pair of support surfaces on opposite sides of the furnace, a driven belt sheave for each drive belt at one end of the furnace and an idler belt sheave for each drive belt at the other end of the furnace, said drive belts having portions that are slidably driven along their respective support surfaces and including upwardly facing surfaces in horizontal alignment with the elongated housing slots and with each other, a plurality of elongated rollers extending through the heating chamber and outwardly through the elongated slots in the housing, the opposite ends of each roller being supported on the upwardly facing surface of the adjacent drive belt so the intermediate portions of the roller within the heating chamber support sheets of glass in a horizontal orientation, and a plurality of positioning members extending upwardly between the rollers from adjacent the support surfaces to prevent movement of the rollers along the elongated direction of the furnace so that frictional engagement of the rollers with the belt driven along the support surfaces rotates the rollers and

thereby conveys sheets of glass through the furnace, said positioning members permitting upward movement of the rollers when the upper housing portion is in the raised position thereof; and

heat seals for sealing between the housing and the rollers at the elongated slots in the housing to mitigate heat flow out of the heating chamber through the slots.

23. A glass tempering system comprising the combination of:

a furnace including an elongated housing defining an elongated heating chamber, heating means for heating said chamber, said housing defining elongated slots at opposite lateral sides of the furnace, said slots communicating with the heating chamber and opening horizontally in alignment with each other;

a first conveyor for moving glass through the furnace from one end thereof to the other, the conveyor including means defining a pair of support surfaces extending horizontally alongside the slots of the housing and located externally of the heating chamber, a pair of continuous drive belt means associated with the pair of support surfaces on opposite sides of the housing, a first pair of belt sheaves rotatably supported on opposite sides of the furnace adjacent the one end thereof and respectively receiving the pair of drive belt means, a second pair of belt sheaves rotatably supported on opposite sides of the furnace adjacent the other end thereof and respectively receiving the pair of drive belt means, a first electric motor drive mechanism for driving the first pair of the drive belt sheaves so that portions of the drive belt means slide along the support surfaces toward the one end of the furnace from the other end thereof, said portions of the pair of drive belt means having upwardly facing horizontal surfaces aligned with the slots in the housing and with each other at the same vertical height, a plurality of elongated rollers extending through the heating chamber and outwardly through the slots in the housing, the opposite ends of each roller being supported on the upwardly facing surface of the adjacent drive belt means so the intermediate portions of the rollers within the heating chamber support sheets of glass in a horizontal orientation, and positioning means locating the rollers longitudinally with respect to the furnace so that frictional engagement of the rollers with the drive belt means rotates the rollers as the drive mechanism drives the first pair of belt sheaves and thereby conveys glass from the one end of the furnace to the other;

a quench unit adjacent the other end of the furnace for quenching the sheets of glass after leaving the furnace;

a second conveyor for carrying the sheets of glass through the quench unit, said second conveyor including means defining a second pair of support surfaces, a second pair of continuous drive belt means, rotatably supported sheaves receiving the second pair of continuous drive belt means so that portions thereof respectively slide over the second pair of support surfaces and define upwardly facing surfaces, a plurality of elongated rollers extending transversely with respect to the elongated direction of the tempering system and having ends respectively supported on the upwardly facing surfaces of the pair of second drive belt means, and positioning means preventing movement of the rollers of the second conveyor longitudinally with respect to the tempering system so that driven movement of the second pair of drive belt means along the support surfaces toward the furnace rotates the rollers supported thereby so as to carry the glass away from the furnace thorugh the quench unit, and a second electric motor drive mechanism for driving the second pair of drive belt means; and

means coupling the first and second conveyors to coordinate the movement thereof so that glass moves at a steady state between the two conveyors.

3,934,971

PROCESS FOR PREPARING MULTICOLORED COTTON PILE FABRIC

Eugene J. Blanchard, New Orleans; Gloria A. Gautreaux, and Robert J. Harper, Jr., both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,244
Int. Cl.² D06P *1/00, 5/12*
U.S. Cl. 8—14 5 Claims

1. A process for producing cotton pile fabrics which are multicolored on one side which process comprises:

a. padding the fabric with a basic catalyst solution,
b. drying the fabric from a,
c. coating the loops on one side of the cotton pile fabric from b with a formulation containing a reactive dye and thickening agent,
d. drying and subsequently curing the fabric from c,
e. washing the cured fabric from d,
f. overdyeing the washed fabric from e with a second reactive dye.

3,934,972

DYEING PROCESS

Colin William Greenhalgh; David Francis Newton; Dennis Eckersley; Ian Cheetham; Duncan Adrian Sidney Phillips; Kenneth Dunkerley; Gerald Williams, and Vibhas Chokshi, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 18, 1974, Ser. No. 452,441
Claims priority, application United Kingdom, Apr. 25, 1973, 19580/73; Oct. 16, 1973, 48080/73
Int. Cl.² C09B *1/00, 5/62;* D06P *3/82*
U.S. Cl. 8—39 13 Claims

1. A process for dyeing textile fibers comprising cellulose or blends of cellulose with polyester fibres which process comprises applying to said fibres an unsulphonated dyestuff containing a dicarboxylic cyclic anhydride grouping or a dicarboxylic acid grouping such that cyclic anhydride formation can occur by loss of water therefrom, or a half ester or half amide of such a dicarboxylic acid grouping, any carboxylic acid group in the said dyestuff being present in free acid form or in the form of a salt with ammonia or a volatile amine, and heating the textile fibre until fixation of the dyestuff takes place.

3,934,973

FINELY DIVIDED COLORANTS

Andrew Shultz, Morris Plains, and Leslie C. Wizemann, Wyckoff, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 721,590, April 16, 1968, abandoned. This application Sept. 20, 1971, Ser. No. 182,234
Int. Cl.² C09B *67/00*
U.S. Cl. 8—79 10 Claims

1. A process for preparing a finely-divided, easily dispersible colorant composition which comprises preparing a slurry of a substrate consisting essentially of a finely-divided, inert, water-insoluble inorganic material in a solution of a dyestuff, removing the solvent from said slurry by atomizing said slurry into a stream of heated gas and recovering the resulting dried product as a free-flowing particulate composition of said inert substrate having said dyestuff evenly dispersed on the surface thereof.

10. A dry, solid particulate colored composition comprising a cleansing composition having uniformly dispersed therethrough a colorant composition as claimed in claim 9.

3,934,974

SOLUTION OF ETHYLAURAMINE HYDROCHLORIDE IN THIODIGLYCOL

Aimé Joseph Arsac, and Roland Jean Dominique Tosan, both of Condrieu, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Sept. 5, 1973, Ser. No. 394,577
Claims priority, application France, Sept. 5, 1972, 72.31355
Int. Cl.² D06P *1/68*
U.S. Cl. 8—93 2 Claims

1. Solution of ethylauramine hydrochloride in thiodiglycol wherein the concentration of ethylauramine hydrochloride is equal to, or greater than 15 percent by weight.

3,934,975

LEATHER TREATING PROCESS

James M. Kelly, Belford, and John G. Papalos, Kearny, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation of Ser. No. 206,969, Dec. 10, 1971, abandoned, which is a division of Ser. No. 93,839, Nov. 30, 1970, abandoned. This application Oct. 10, 1973, Ser. No. 405,113
Int. Cl.² C14C *3/18*
U.S. Cl. 8—94.24 11 Claims

1. In a method of treating leather stock whose wrung split shave weight is normally 40 to 50 percent by weight of water, comprising

A. washing the stock in 400 percent water for 15 minutes and draining,
B. refloating the stock for 30 minutes in 100 percent water at 80° F and neutralizing with 0.06% sodium bicarbonate,
C. washing the stock in a float at 130° F for 10 minutes and draining,
D. adding 2 to 10 percent by weight of solids of a leather treating composition (syntan) per 100 percent at 130° F and running for 1½ hours,
E. adjusting the system with formic acid to the lowest equilibrium pH and running for 15 minutes,
F. further adjusting the system with formic acid to a pH of 3.5 and running for an additional 15 minutes,
G. washing the stock for 10 minutes in cold water,
H. heating the stock to 130° F, washing for 10 minutes and draining,
I. fat-liquoring the stock with 8 percent solids per 100 percent float at 130° F with a fat liquor consisting of an emulsified oil whose emulsifier is of a nonrewetting character,
J. rinsing the stock, washing for 10 minutes and horsing up the stock,
K. rinsing out the stock and tacking it up to dry in an oven at 140 degrees F for 4 hours,
L. allowing the stock to lay over for 3 days to pick up moisture, and
M. drying and staking the stock,

the improvement which comprises using a leather treating composition in step D comprising an alkyl phenol - polyphenol condensate which has been alkoxylated and phosphated, and in which

A. the alkyl phenol is selected from at least one of a group consisting of saturated or unsaturated linear or branched chain C_6 to C_{20} alkyls,
B. the phenol moiety of the alkyl phenol is selected from at least one of a group consisting of phenols, thiophenols, and phenols substituted with at least one member of the group consisting of hydroxyl radicals, halogen atoms, nitro radicals, methyl radicals, ethyl radicals, propyl radicals and phenyl radicals.
C. the polyphenol is selected from at least one of a group consisting of fused ring, polyaryl, and polyaralkyl polyphenols having from 2 to 15 benzene rings per molecule, including polyphenols substituted with at least one mem-

ber of the group consisting of hydroxyl radicals, halogen atoms, nitro radicals, methyl radicals, ethyl radicals, and propyl radicals.

D. the alkyl phenol and polyphenol are joined by an aldehyde, substituted aldehyde, or aldehyde liberating composition.

E. the alkoxylating agent is selected from at least one of a group consisting of ethylene oxide, propylene oxide, butylene oxide and iso-butylene oxide, and

F. the phosphating agent is selected from at least one of a group consisting of polyphosphoric acid, phosphoric acid, phosphorous pentoxide, pyrophosphoric acid, phosphorous acid, and phosphorous oxychloride,

further characterized in that the total number of benzene rings contained in one molecule of the condensate is between 3 and 16.

3,934,976
TRACE LEAD ANALYSIS METHOD

Catherine A. Zelaskowski, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,545
Int. Cl.² G01N *31/22*, *33/20*, *33/22*
U.S. Cl. 23—230 R 9 Claims

1. A method for colorimetrically determining the lead content in gasoline comprising (1) mixing a gasoline sample containing tetraalkyllead with iodine in the presence of a tetraorganoammonium halide and exposing the mixture to ultra-violet radiation from a 3660 A wavelength ultra-violet source for a period of from 30 seconds to about 10 minutes sufficient to convert the tetraalkyllead to dialkyllead diiodide, (2) mixing the resulting reaction mixture with an aqueous solution of an acidic compound selected from the group consisting of nitric acid and ammonium nitrate and separating the resulting aqueous phase from the organic gasoline phase, and (3) combining the aqueous phase with an alkali metal salt of 4-(2-pyridylazo)-resorcinol in an aqueous solution to produce a color corresponding to the initial lead concentration.

3,934,977
REAGENT AND METHOD FOR DETERMINING TOTAL CALCIUM IN BODY FLUIDS

Kenneth E. Cleaver, Woodbury, N.J., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 9, 1974, Ser. No. 496,003
Int. Cl.² G01N *31/22*, *33/16*
U.S. Cl. 23—230 B 7 Claims

1. A method for the rapid determination of total calcium in protein-containing body fluids, comprising the steps of mixing a sample of body fluid with a color reagent consisting essentially of an aqueous solution of chlorophosphonazo III buffered to a pH within the range of 5.0 to 5.5 by a buffer comprising potassium hydrogen phthalate, and thereafter optically comparing the color development of the sample-reagent mixture with that of the same reagent mixed with a standard of known calcium concentration.

3,934,978
METHOD FOR ASSAY OF PROSTAGLANDINS

William O. McClure, So. Pasadena, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Filed Oct. 7, 1974, Ser. No. 512,446
Int. Cl. G01n *21/00*, *31/08*, *33/16*
U.S. Cl. 23—230 B 10 Claims

1. A method for assaying prostaglandins of the E and F series comprising the sequential steps of reducing the keto groups in a sample containing the prostaglandins to hydroxy groups, selectively oxidizing the prostaglandin 15-OH groups to keto groups, reducing the keto groups to hydroxy groups by means of a radioactive labeled chemical reducing agent, isolating radioactive labeled prostaglandins and measuring the amount of radioactivity of the isolated radioactive labeled prostaglandins.

3,934,979
METHOD OF ASSAY FOR PROSTAGLANDINS OF THE F ALPHA SERIES

William O. McClure, S. Pasadena, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Filed Oct. 7, 1974, Ser. No. 512,447
Int. Cl. G01n *21/00*, *31/08*, *33/16*
U.S. Cl. 23—230 B 9 Claims

1. A method for assaying prostaglandins of the Fα series comprising reacting a prostaglandin of the Fα series with a compound having the formula

where R is a radical containing a fluorescent or radioactive label, isolating the labeled reaction products, and respectively measuring the amount of fluorescence or radioactivity of the labeled reaction product.

3,934,980
METHOD OF ASSAY FOR PROSTAGLANDINS OF THE E SERIES

William O. McClure, So. Pasadena, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

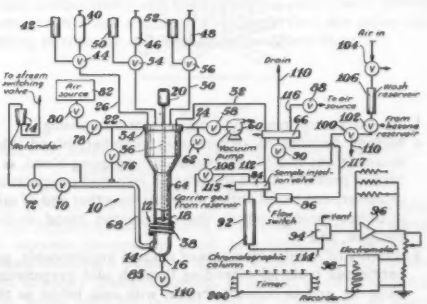
Filed Oct. 7, 1974, Ser. No. 512,448
Int. Cl. G01n *21/00*, *31/08*, *33/16*
U.S. Cl. 23—230 B 9 Claims

1. A method for assaying for prostaglandins of the E series comprising reacting prostaglandins of the E series with sodium borotritide in a suitable solvent, isolating the tritiated prostaglandins, and measuring the amount of radioactivity of the isolated tritiated prostaglandins.

3,934,981
APPARATUS FOR DETECTION OF CHLOROMETHYL METHYL ETHER OR BIS-CHLOROMETHYL ETHER

Eldon F. Ault, and Richard A. Solomon, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 303,123, Nov. 2, 1972, abandoned. This application July 12, 1973, Ser. No. 378,479
Int. Cl.² G01N *31/08*
U.S. Cl. 23—253 R 10 Claims



1. Apparatus to determine the presence of chloromethyl methyl ether or bis-chloromethyl ether in a fluid comprising:

a. an enclosed reaction chamber;

b. first means for introducing a predetermined amount of an alkali metal salt of an organic hydroxy compound, dissolved in a lower alcohol, into said reaction chamber;

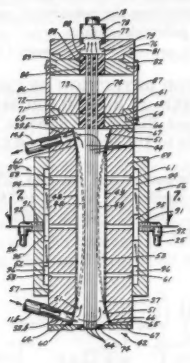
c. means for passing a preselected amount of said fluid into admixture with said compound in said chamber;
d. second means for introducing a liquid hydrocarbon solvent into said reaction chamber, which solvent is characterized as being immiscible with, and capable of floating upon, said lower alcohol solution;
e. means for agitating any liquid in said chamber;
f. a gas chromatographic column;
g. a suitable detector adapted to receive effluent from said column and to provide an output signal;
h. means for selectively withdrawing part of said solvent, as a liquid, from said chamber without withdrawing any significant portion of said lower alcohol solution, said apparatus thereby being adapted for the carrying out of a solvent extraction step within said chamber;
i. means, including a sample injection valve, for applying said withdrawn liquid solvent to said chromatographic column;
j. means for eluting components from said column and for transporting said components to said suitable detector;
k. output signal display means coupled to said detector; and
l. timed controller means for sequentially controlling said first and second means for introducing, means for passing, means for withdrawing solvent as a liquid, and means for applying.

3,934,982

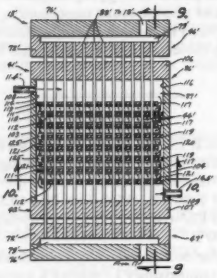
BLOOD OXYGENATOR

Leon J. Arp, 1107 Highland Circle S.E., Blacksburg, Va. 24061

Continuation-in-part of Ser. No. 258,817, June 1, 1972, abandoned. This application May 21, 1974, Ser. No. 471,876
Int. Cl.[2] A61M *1/03*
U.S. Cl. 23—258.5 M 9 Claims



1. An extra-corporeal blood oxygenator comprising:
a housing forming an oxygenation chamber; blood inlet means at one end of said chamber for passing blood, at a certain pressure, to be oxygenated into said oxygenating chamber, and blood outlet means at the other end of said chamber through which the oxygenated blood is discharged; and
a plurality of tubular elements of a liquid impermeable, gas permeable material extending through said oxygenating chamber and in contact therein with said blood as the blood passes through said chamber; oxygen inlet and outlet means located at opposite ends of said tubular elements for carrying oxygen therethrough at a partial pressure greater than the partial pressure of the oxygen in the blood as the blood is transmitted through said chamber;
and wherein said oxygenating chamber has a pair of opposed sidewalls, said oxygenator further including a pair of opposed flexible walls located within said oxygenating chamber, each said flexible wall being sealed about its periphery to one of said opposed sidewalls of said chamber, and means attached to said housing, including a plurality of spaced openings formed in a portion of said housing, for transmitting a fluid through said openings and into a cavity formed between each respective pair of a chamber sidewall and a flexible wall sealed thereto to move said flexible wall within said chamber, said flexible walls being adapted to contact the blood moving through said chamber and operable, upon movement thereof by said fluid, to agitate said blood within said chamber.



4. An extra-corporeal blood oxygenator comprising:
housing means having an oxygenating chamber formed therein and having blood ingress and blood egress means for said chamber;
means connected to said ingress means for transmitting blood in a pulsating manner under pressure to be oxygenated into said chamber;
tubular means disposed within said chamber and comprised of a liquid impermeable, gas permeable material;
means connected to said tubular means for transmitting oxygen therethrough under a partial pressure greater than the partial pressure of oxygen in the blood within said oxygenating chamber,
baffle means mounted within said chamber and including a plurality of spaced baffles, said plurality of baffles being longitudinally spaced apart relative to and located between said blood ingress and blood egress means, alternate ones of said baffles engaging opposite walls of said chamber, said baffle means directing the blood through said chamber in a continually reversing path between said ingress and egress means, said path being substantially normal to said tubular means when disposed between said walls; and
means connected to said egress means for withdrawing the oxygenated blood from said chamber.

3,934,983

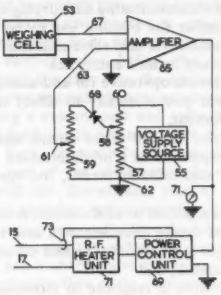
WEIGHING CELL APPARATUS FOR DIAMETER CONTROL OF A ROTATABLE GROWING CRYSTAL

William Bardsley, West Malvern; Geoffrey William Green, Malvern; Charles Harry Holliday, Newland, and Donald Thomas James Hurle, Welland, all of England, assignors to National Research Development Corporation, London, England

Filed Sept. 7, 1973, Ser. No. 395,172
Claims priority, application United Kingdom, Sept. 8, 1972, 41726/72
Int. Cl.[2] B01J *17/00, 17/20*
U.S. Cl. 23—273 SP 4 Claims

1. Apparatus for the growth of crystalline material including means for establishing a melt of a given crystallizable material, a pull rod arranged for pulling a crystal from said melt when established, means for lifting said pull rod from said melt to pull said crystal on one end of said rod, means for rotating said

pull rod about its axis while said rod is being lifted, said means for rotating including a substantially tubular member surrounding said rod and attached to said rod whereby said rod rotates together with said member, and a construction for monitoring the weight of said crystal for the purpose of closed-loop control of said crystal comprising a weighing cell attached to said rod near the end of said rod opposite to said first mentioned end to measure the weight of said rod and said crystal, a weighing cell support housing arranged to support



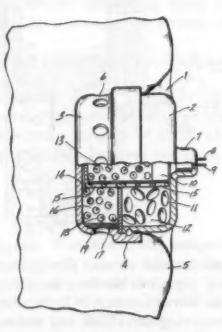
said weighing cell, said support housing including a support plate having an aperture through which said rod and said tubular member pass, said support plate being arranged so as to be lifted by said lifting means whereby said housing, said weighing cell and said rod are all lifted together and, located in said aperture, a bearing having an inner race fixed to said tubular member and outer race fixed to said support plate whereby said tubular member is attached to said support plate and said tubular member and said rod may be rotated without rotating said support plate.

3,934,984

GAS GENERATOR

Darrell W. Marlow, Herrin, and Brady L. Freeman, Carterville, both of Ill., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 10, 1975, Ser. No. 540,059
Int. Cl.² B01J *7/00*; B60R *21/08*
U.S. Cl. 23—281 **2 Claims**



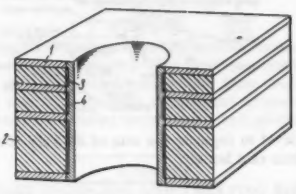
1. A gas generator for an inflatable occupant restraint comprising a housing, a propellant chamber in said housing, a gas generating charge in said chamber, means for igniting said charge in response to a predetermined signal, an outlet in said housing for the expulsion of gases formed upon igniting and burning of said charge, a cooling chamber formed between said propellant chamber and said outlet, said cooling chamber including a plurality of hollow, metallic balls each having an opening through the surface thereof.

3,934,985

MULTILAYER STRUCTURE

Georgy Avenirovich Kitaev, ulitsa Mira 36, kv. 30; Vadim Alexandrovich Ploskikh, ulitsa Bazhova, 76, kv. 32, both of Sverdlovsk; Viktor Alexeevich Minkov, Leningradskoe shosse, 86/1, kv. 81; Viktor Georgievich Kurbakov, Leningradskoe shosse, 56, kv. 231, both of Moscow; Evangelina Mikhailovna Chernysheva, ulitsa Ekskavatornaya, 50, kv. 6, Sverdlovsk; Tatyana Nikolaevna Zlatkovskaya, ulitsa 40 let Oktyabrya, 26, kv. 48, Sverdlovsk, and Viktor Timofeevich Brunov, ulitsa Belinskogo, 8/10 kv. 14, Sverdlovsk, all of U.S.S.R.

Filed Oct. 1, 1973, Ser. No. 402,626
Int. Cl.² B32B *15/04*
U.S. Cl. 29—183.5 **2 Claims**



1. A multilayer structure comprising: metal layers; dielectric layers disposed between and alternating with said metal layers; and intralayer junctions for interconnecting said metal layers, said junctions being integral with end faces of said metal layers, and being constituted by films of an electrolytically deposited metal.

3,934,986

INSTANT STARTING BRIQUETTES

Souren Z. Avedikian, 161 Harbor Drive, Key Biscayne, Miami, Fla. 33149

Filed Jan. 25, 1974, Ser. No. 436,501
Int. Cl.² C10L *9/00, 10/00*
U.S. Cl. 44—6 **2 Claims**

1. An improved instant-igniting charcoal briquette impregnated with a combustion supporting material selected from the group consisting of straight chain aliphatic alcohols, acids, and mixtures thereof which have a minimal vapor pressure at room temperatures and have a melting point above ambient temperatures and a compound selected from the group consisting of trioxane, tetra-oxane and mixtures thereof.

3,934,987

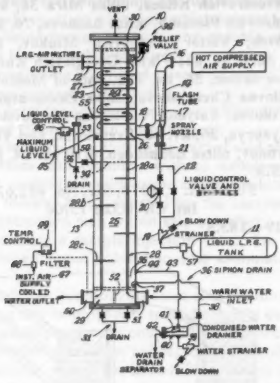
BLENDING APPARATUS

Henry W. Bivins, Jr., 5030 Brummel, Skokie, Ill. 60076

Filed Mar. 25, 1974, Ser. No. 454,067
Int. Cl.² B01F *3/02*
U.S. Cl. 48—180 C **16 Claims**

13. Apparatus for providing from a liquid fuel fluid supply an aerated gaseous fuel fluid, comprising: heat exchanger means defining a chamber having a lower chamber portion and an upper chamber portion, an inlet to a lower portion of said upper chamber portion, and an outlet from an upper portion of said upper chamber portion; means defining a flash chamber; means for delivering liquid fuel fluid from said supply into hot air in said flash chamber; means for delivering the resultant mixture of fuel fluid and air through said inlet into said heat exchanger chamber wherein liquid fluid of said mixture collects in said lower chamber portion and gaseous fluid thereof passes upwardly through said upper chamber portion to said outlet; and means for limiting the level of liquid

fluid in said heat exchanger to a preselected level below the level of said inlet including means responsive to variations in



the liquid level to regulate the rate of delivery of said liquid fuel fluid into said hot air.

3,934,988

ALUMINUM SILICATE PARTICLES HAVING A LAYER OF A RARE EARTH OXIDE THEREON

Leslie Theodore Barfield, Rotherham, England, assignor to London & Scandanavian Metallurgical Co., Limited, England

Filed May 29, 1974, Ser. No. 474,153

Claims priority, application United Kingdom, May 30, 1973, 25681/73

Int. Cl.² B24D *3/34*

U.S. Cl. 51—308 **5 Claims**

1. A calcined polishing powder comprising an alumina silicate compound of the mullite type, the particles of which have a layer of at least about 5% by weight based on the weight of the composition of a rare earth oxide thereon.

3,934,989

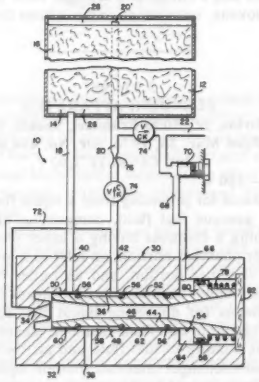
GAS DRYING APPARATUS

Ronald L. Haugen, Pennington, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 340,290, March 12, 1973, abandoned. This application July 17, 1974, Ser. No. 489,141

Int. Cl.² B01D *53/04*

U.S. Cl. 55—163 **11 Claims**



1. Gas drying apparatus, comprising:

a gas drying chamber;

conduit means for admitting gas to said chamber for drying gas therewithin, and for exiting dried gas from said chamber; and

valving means, coupled to said conduit means, pneumatically operative for controlling gas admittance and exiting, wherein

said valving means comprises a valve body having a valve chamber formed therewithin and a valving element pneumatically movably disposed within said valve chamber;

said valving means and said conduit means comprise first means for communicating said drying chamber with said valve chamber for causing gas to be admitted to said drying chamber via said valve chamber; and wherein said valving means further comprises

pilot signal means operative for addressing gas to said valving element pneumatically to effect movement of said valving element,

means coupled to said latter means and to said conduit means, responsive to a predetermined gas pressure subsisting in said conduit means, for operating said latter means,

second means, joined to said conduit means, for communicating said drying chamber with said valve chamber for causing gas to be admitted to said drying chamber via said valve chamber, and

means operative in response to movement of said valving element, and cooperative with said second means and said conduit means, for producing a partial vacuum, for applying the vacuum to said drying chamber, and for evacuating said chamber.

3,934,990

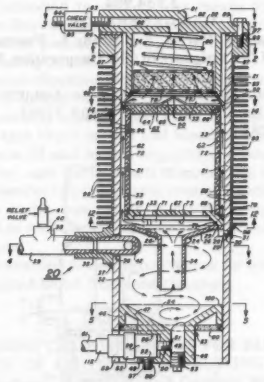
AIR COOLER AND CLEANER FOR COMPRESSED AIR

Thomas N. Ide, III, Drexel Hill, Pa., assignor to Stratoflex, Inc., Fort Worth, Tex.

Filed Mar. 17, 1972, Ser. No. 235,767

Int. Cl.² B01D *45/12*

U.S. Cl. 55—218 **14 Claims**



1. An air cooler and cleaner for operative mounting in a compressed-air pipe-line between an air-compressor and its compressed-air storage-reservoir, for cooling the compressed-air and for removing therefrom any moisture, lubricating-oil and solid particles which may be entrained therein, said air cooler and cleaner including a cooling-chamber, an unbaffled swirl-chamber adjacent the upstream end of the cooling-chamber, a compressed-air inlet arranged to be connected with the discharge outlet of an air-compressor and communicating with said swirl-chamber in a zone thereof substantially nearer the cooling-chamber than the opposite end thereof and arranged to deliver the compressed-air from the compressor into the swirl-chamber generally tangentially with respect thereto and to freely swirl the compressed-air in the swirl-

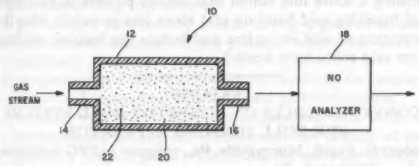
chamber without baffled interruption, to separate therefrom liquid and solid particles entrained therein, a contaminant-drain-opening forming an exit from said swirl-chamber, and the lower portion of said swirl-chamber being pitched downwardly towards said drain-opening, a member positioned between and separating the cooling-chamber and the swirl-chamber and separating its tangential air-inlet from the cooling-chamber, said member having a hole therethrough, an air-exit tube carried by said member and communicating with and extending from the hole therein into the swirl-chamber a substantial distance beyond its tangential air-inlet, and spaced from said swirl-chamber exit thereby to cause the swirling motion of the compressed-air to extend a substantial distance axially into the swirl-chamber before the compressed-air passes from the swirl-chamber into the cooling-chamber, an automatic drain-valve operatively connected with said drain-opening and having a control-port and arranged to be controlled by a pilot-fluid under pressure from the compressor and arranged to have its control-port connected with the pilot-fluid output-port of the compressor, an air-outlet-port communicating with the downstream side of said cooling-chamber, said swirl-chamber and said cooling-chamber being so arranged with respect to each other that the compressed-air will flow from the swirl-chamber into and through the cooling-chamber, and a check-valve connected with said air-outlet-port for barring the flow of the compressed-air from the storage-reservoir into the cooling-chamber.

3,934,991

NITRIC OXIDE ANALYSIS AND SCRUBBER THEREFOR

John P. Frain, Costa Mesa; John N. Harman, III, Placentia, and Radhakrishna M. Neti, Brea, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 1, 1971, Ser. No. 119,601
Int. Cl.[2] B01D *39/04*
U.S. Cl. 55—316 5 Claims



1. A scrubber apparatus for selectively removing nitrogen dioxide from a gas stream containing nitric oxide without affecting the nitric oxide content of the stream, said apparatus comprising:

a. a container having an inlet port for the gas stream and an outlet port; and

b. a scrubber material in the container including silver carbonate whereby the scrubber has an efficiency of at least about 99% and a capacity of about 11.5 ppm hours of 99% nitrogen dioxide removal per gram of silver carbonate.

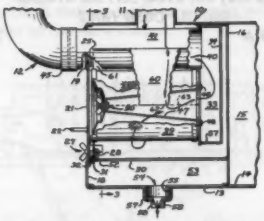
3,934,992

TRUCK AIR FILTER

Terrence V. Thompson, Woodstock, Ill., assignor to Terrence V. Thompson, Woodstock; George Athans, Cary and Leonidas Athans, Crystal Lake, all of, Ill.

Filed June 19, 1974, Ser. No. 480,607
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—324 8 Claims

1. In combination with an enclosed tank mounted on a motor vehicle and having horizontally extending wall means of closed cross section, an air filter system for delivering air to a discharge air conduit comprising a housing including a side wall connected to and supported by said tank, said side wall of said housing having the same cross section as said wall means of said tank and being a horizontal extension thereof; a vertical rear wall interposed between said filter system and said tank, and a front wall spaced laterally from said rear wall and including an access aperture; inlet air conduit means communicating through said housing for delivering air thereto; baffle means for intercepting air delivered from said inlet conduit for distributing the same within said housing; a plenum within said housing; air filter element means within



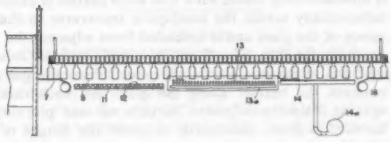
said housing for filtering air from said baffle means prior to its entering into said plenum; a front panel removably mounted to cover said access aperture in said front wall to permit access to said filter element means; and extension conduit means for communicating the interior of said plenum with said discharge air conduit.

3,934,993

GLASSWARE HANDLING AND TREATING EQUIPMENT

Edward W. Bowman, deceased, late of Tampa, Fla.; by Muriel B. Bowman, executrix, and by Michael Edward Bowman, executor, both of Uniontown, Pa., assignors to E. W. Bowman, Incorporated, Uniontown, Pa.

Filed July 18, 1974, Ser. No. 489,732
Int. Cl.[2] C03C *17/00*
U.S. Cl. 65—60 5 Claims



1. Apparatus for maturing a spray coating applied to bottles following annealing comprising

a. conveyor means adapted to be positioned at the outlet end of an annealing lehr,

b. gripping means on said conveyor means for gripping only the neck of said bottles and suspending said bottles while moving the length of the conveyor,

c. heating means for heating the base of the bottles while suspended to remove surface irregularities caused by supporting the coated bottoms of the bottles before the coating is set or matured,

d. spray means downstream of said heating means for applying a coolant to the bottom of the bottles after the same have passed over said heating means, and

e. blower means downstream of said spray means for removing the coolant previously sprayed on the bottoms of said bottles.

5. A method of removing surface irregularities from the bottom of bottles having a nonabrading coating thereon comprising the steps of:

a. gripping said coated bottles by the necks thereof so as to suspend said bottoms thereby exposing the bottoms thereof, and conveying the bottles when so gripped,

b. heating the bottoms of said bottles when so suspended to remove the surface irregularities,

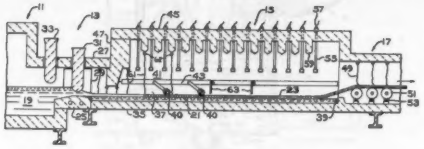
c. applying a coolant to the bottoms of said bottles when so suspended following heating so as to set the treated surface, and

d. drying the cooled bottom surface of said bottles while suspended, whereby the bottoms of said bottles are matured.

3,934,994
CONTROL OF THERMAL CONVECTION IN A FLOAT GLASS FORMING CHAMBER

William J. Muhlstadt, Natrona Heights, and James R. Schornhorst, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 30, 1974, Ser. No. 474,846
Int. Cl.² C03B 18/02
U.S. Cl. 65—65 A 10 Claims



1. In a method of making flat glass wherein molten glass is delivered onto a pool of molten metal in an enclosed chamber having a roof extending over the pool of molten metal providing a headspace between the roof and the pool of molten metal, which headspace is filled with a gaseous atmosphere; wherein, following its delivery, the glass is advanced along the surface of the pool of molten metal from an inlet end of the chamber to an outlet end of the chamber and, while being so advanced, is cooled and subjected to tractive forces whereby the glass is formed as a dimensionally stable, continuous sheet of glass; and then removing the dimensionally stable, continuous sheet of glass from the pool of molten metal and from the enclosed chamber, the improvement which comprises

a. positioning a plurality of barriers in the headspace above the advancing glass in a region of the chamber extending from its inlet end to a location where the advancing glass is dimensionally stable such that each barrier is extended substantially across the headspace transverse to the advance of the glass and is extended from adjacent the roof downwardly into a sufficiently closely spaced relation with the advancing glass to prevent substantial gas flow beneath the barrier along the glass and such that the spacing between adjacent barriers of said plurality of barriers is from one-fourth to twice the height of the chamber headspace between the surface of the pool of molten metal and the roof; and

b. removing sufficient heat from the chamber between adjacent barriers to establish a convective flow of gases in the headspace between adjacent barriers that is substantially less intense than the flow of gases in the headspace of the chamber in the absence of such barriers;

whereby the rate at which the advancing glass is cooled following its delivery onto the pool of molten metal and prior to its reaching dimensional stability is sufficiently low to yield a continuous sheet of glass having observably less optical distortion than that of glass produced in the absence of such spaced barriers.

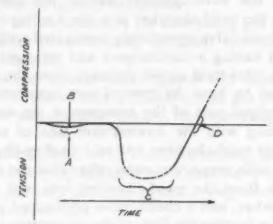
5. In a glassmaking apparatus including a glass forming chamber having an inlet end and an outlet end containing a pool of molten metal for supporting glass during forming in the chamber and having a substantially enclosed upper portion enclosing a headspace for containing a gaseous atmosphere over the pool of molten metal, means for delivering molten glass onto the pool of molten metal at the inlet end of the chamber, means for advancing delivered glass along the surface of the molten metal, means for cooling of the glass for forming a continuous sheet of glass from the molten glass and means for removing the continuous sheet of glass from the chamber at its outlet end, the improvement comprising:

a plurality of barriers positioned in a region of the chamber extending from its inlet end one-third of its length toward its outlet end, each barrier extending transversely across the chamber and being sufficiently closely spaced from the pool of molten metal to prevent the substantial flow of gases along the length of the chamber parallel to the intended direction of glass advance, with adjacent barriers being spaced from one another a distance of from about ¼ to about 2 times the height of the chamber headspace.

3,934,995
METHOD OF CUTTING HOT GLASS BAND

Walter K. French, Montrose, N.Y., assignor to The Seagrave Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 426,526, Dec. 20, 1973, Pat. No. 3,875,766, and a continuation-in-part of Ser. No. 470,815, May 17, 1974. This application Feb. 27, 1975, Ser. No. 553,494
Int. Cl.² C03B 21/00
U.S. Cl. 65—97 3 Claims

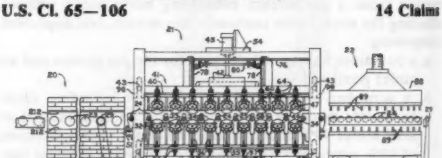


1. The method of making discrete glass sheets from a ribbon of glass proceeding from a melt, said glass being in the temperature range of from about 1000° to about 1300°F, which comprises the steps of subjecting at least a surface area of said band to a quenching influence in quantity sufficient to place the surface area in slight tension, said quench reducing the temperature of said surface area to a range about 50°F or less below the maximum temperature of the interior of said band, forming a score line across said chilled portion of said band and breaking said band on said score line promptly after the formation of said score line and before the fissures resulting from said score have healed.

3,934,996
CONVEYOR ROLLS ON CONVEYOR ROLL SYSTEMS FOR ROLL FORMING APPARATUS

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 2, 1974, Ser. No. 466,342
Int. Cl.² C03B 23/02
U.S. Cl. 65—106 14 Claims



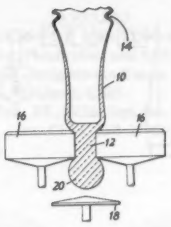
1. A method of shaping sheets comprising conveying a heat-softened sheet into a sheet forming station comprising upper and lower sets of rotatable forming rolls having complementary curvatures while supported on a plurality of rotating rigid conveyor rolls of cylindrical configuration having a common upper tangent defining a support plane, rotating said rotatable forming rolls, lifting said softened sheet on a plurality of said lower set of said rotating shaped forming rolls until the opposite surfaces of said deformable sheets are engaged and fed longitudinally between said upper and lower sets of rotating forming rolls for sufficient time to shape said sheet to conform to said complementary curvatures, lowering said shaped sheet on said lower set of rotating forming rolls near the downstream end thereof to transfer said shaped sheet onto a series of flexible rotating conveyor rolls capable of self-con-

forming to the shape of the formed sheets and removing the shaped sheets while supported on said flexible conveyor rolls.

3,934,997
PRODUCTION OF ONE-PIECE STEMWARE FROM GLASS, ETC.

David Harold Inns, Chesterfield; William Roy Bennett, Dronfield, near Chesterfield, and Arnold Chambers, Chesterfield, all of England, assignors to Glass Tubes and Components Limited, Chesterfield, England

Continuation of Ser. No. 385,880, Aug. 6, 1973, abandoned, which is a division of Ser. No. 275,447, July 26, 1972, Pat. No. 3,773,490. This application Dec. 4, 1974, Ser. No. 529,537
Claims priority, application United Kingdom, Aug. 2, 1971, 36199/71
Int. Cl.² C03B 21/00
U.S. Cl. 65—109 7 Claims



1. A method of manufacturing a stemmed article, such as a drinking vessel or vase, from a viscous settable material, such as glass, comprising the steps of:

a. providing a part-formed article having a glob of at least semi-molten material in the position where the stem is required;

b. supporting said part-formed article vertically for rotation about its longitudinal axis with said glob lowermost;

c. rotating said article about its longitudinal axis while simultaneously rolling the circumferential surface of the glob in a vertical plane with rollers the surfaces of which conform to the desired shape of the finished article;

d. reducing the distance between the rollers to form the stem of the desired shape and configuration without stretching; and

e. advancing a foot-forming member towards the glob and applying pressure thereagainst to form a radially extending foot on said stem.

3,934,998
NECK RING CARTRIDGE FOR GLASSWARE MACHINE

George E. Rowe, deceased, late of Wethersfield, Conn. (by Selma S. Rowe, executrix), assignor to Emhart Corporation, Hartford, Conn.

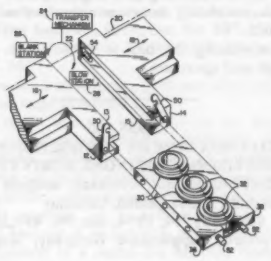
Filed June 26, 1974, Ser. No. 483,284
Int. Cl.² C03B 9/00
U.S. Cl. 65—172 2 Claims

1. In a glassware forming machine of the type having a blank mold station wherein several preliminary parisons are formed, a blow mold station for final forming several glassware articles from these parisons, and a neck ring mechanism for transferring these parisons from the blank station to the blow station, the improvement comprising:

a. left and right hand neck ring arms, both of which arms include inner portions for attachment to the neck ring mechanism whereby said arms are both movable from and to said blank and blow stations, and also individually movable toward and away from one another,

b. said neck ring arms having longitudinally extending surfaces which face one another, each such neck ring arm surface defining at least one longitudinally extending channel open onto said surface,

c. left and right hand neck ring cartridges, each such cartridge having one longitudinally extending side edge which is slidably received in an associated one of said neck ring arm channels, left and right hand neck ring mold segments for forming neck portions of the parisons at the blank station and for supporting the parisons during transfer to the blow station,



d. said cartridge having facing portions which define locating surfaces for receiving said neck ring mold segments and neck ring mold mounting means for retaining said mold segments against said locating surfaces and in said cartridges, and

e. quick disconnect attachment means for retaining said cartridges in said channels to facilitate the removal and replacement of said neck ring mold segments by removing the cartridges.

3,934,999
COMPOSTING METHOD AND APPARATUS

Harold R. Meier, Minneapolis, Minn., assignor to Judd Ringer Corporation, Eden Prairie, Minn.

Filed Apr. 18, 1973, Ser. No. 352,242
Int. Cl.² C05F 9/02, 9/04; B65D 25/08, 31/00
U.S. Cl. 71—9 7 Claims

1. A method of rapidly composting organic material, which method comprises:

providing a flexible bag having an open end, a plurality of apertures through the body portion of the bag, said apertures being sufficiently large to permit the ready passage of air and gas therethrough but sufficiently small to prevent the escape therethrough of any substantial amount of the organic material to be composted,

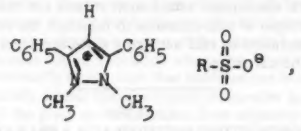
substantially filling said bag with organic material to be composted,
adding thereto a predetermined amount of an aqueous solution containing therein numerous minute particles which tend to facilitate decomposition of the organic material,
closing the open end of said bag so that said bag is substantially closed except for said apertures therethrough,
placing said bag upon a supporting surface which normally maintains said bag in a stationary condition,
periodically compressing said bag to force out of said bag gases accumulating therein as a result of such decomposition, and
then manipulating the bag to allow air to enter therein through said apertures.

3,935,000
HERBICIDAL MIXTURE OF A PYROZOLIUM SALT AND BENZOTHIADIOZINONE DERIVATIVE

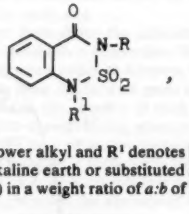
Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 14, 1974, Ser. No. 497,329
Claims priority, application Germany, Aug. 17, 1973, 2341594
Int. Cl.² A01N 9/12
U.S. Cl. 71—91 **4 Claims**

1. A herbicide composition consisting essentially of an inert carrier and a herbicidally effective amount of a mixture of
a. a compound of the formula



in which R denotes lower alkoxy or phenyl which may be substituted by lower alkyl, and
b. a compound of the formula



in which R denotes lower alkyl and R^1 denotes hydrogen, or an alkali metal, alkaline earth or substituted amine salt of said compound (b) in a weight ratio of *a:b* of 5:1 to 1:5.

3,935,001
HERBICIDE MIXTURES OF URACIL, A CARBAMATE AND A PYRIDAZONE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

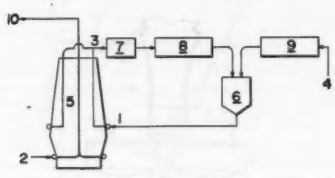
Division of Ser. No. 348,085, April 4, 1973. This application July 30, 1974, Ser. No. 493,115
Claims priority, application Germany, Apr. 13, 1972, 2217698
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 **1 Claim**

1. A herbicide composition containing a herbicidally effective amount of a mixture of herbicides consisting of:
a. 3-cyclohexyl-5,6-trimethylene uracil,
b. 3-methoxycarbonylaminophenyl-N-(3′-methylphenyl)-carbamate, and
c. 1-phenyl-4-amino-5-chloropyridazone-(6) in a weight ratio of a:b:c of 1–10: 1–10:1–10.

3,935,002
METHOD OF BLAST FURNACE OPERATION UTILIZING SELECTIVE RECYCLING OF PERIPHERAL GAS STREAM

Tsuneo Miyashita, and Hiroaki Nishio, both of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1974, Ser. No. 457,720
Int. Cl.² C21B 5/06
U.S. Cl. 75—42 **2 Claims**



1. In a method of blast furnace operation of the type in which a reducing gas produced by reforming a mixture of a peripheral gas stream taken out from the top or shaft portion of a blast furnace and a fresh feed materials is injected into the blast furnace through reducing gas inlet ports other than the ordinary tuyeres, wherein said peripheral gas stream is taken out through a plurality of outlet ports the improvement comprising determining the number of said outlet ports in accordance with either one of the following equations:

$$\text{when } n \leqq k\,m \geqq \frac{C/H}{1.45(C/H)+2.7}\,n$$

$$\text{when } n > k\,m \geqq \frac{C/H}{1.45(C/H)+2.7}\,k$$

$$\text{where } k = 75.2 - 268\left(\frac{U}{U+V}\right) + 375\left(\frac{U}{U+V}\right)^2 - 187\left(\frac{U}{U+V}\right)^3$$

U/U+V = ratio of injected reducing gas quantity (U) to the total gas quantity (U+V) passing through furnace
V = quantity of gas produced from the blast by the combustion of coke and solution loss reaction
m = number of outlet ports for peripheral gas stream
n = number of inlet ports for reducing gas
C/H = ratio by weight of C to H contained in a fresh feed gas

and positioning said outlet ports for peripheral gas stream relative to said inlet ports for reducing gas so that there is a predetermined angular relation therebetween established in accordance with the following equation:

$$\theta \leq \left[2.52 \times 10^4 \left(\frac{U}{n(U+V)}\right)^3 - 4.53 \times 10^3 \left(\frac{U}{n(U+V)}\right)^2 + 2.83 \times 10^3 \left(\frac{U}{n(U+V)}\right)\right]$$

where

θ = angle made between vertical plane formed by peripheral gas stream outlet port and furnace center line and vertical plane formed by reducing gas inlet port and furnace center line (in degrees)

n = number of reducing gas inlet ports

U = quantity of reducing gas injected

V = quantity of gas produced from blast by the combustion of coke and solution loss reaction

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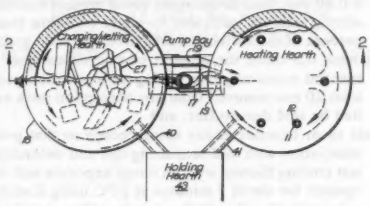
3,935,003
PROCESS FOR MELTING METAL

Theodore D. Steinke, Pleasanton, and Melvin A. Carter, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 25, 1974, Ser. No. 445,721
Int. Cl.² C22B 21/00
U.S. Cl. 75—68 R **10 Claims**



1. A method of melting metal comprising

a. maintaining a body of molten metal in a heating chamber;

b. withdrawing molten metal from said heating chamber;

c. pumping a portion of said withdrawn molten metal to a melting chamber containing solid metal so as to melt said solid metal;

d. pumping a portion of said withdrawn molten metal to said heating chamber so as to maintain a substantially homogeneous melt in said heating chamber; and

e. returning molten metal from said melting chamber to said heating chamber.

3,935,004
ADDITION OF ALLOYING CONSTITUENTS TO ALUMINUM

John Porter Faunce, Columbia, Md., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 399,176, Sept. 20, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,330
Int. Cl.² C22C 1/02
U.S. Cl. 75—68 R **19 Claims**

12. A process for the addition of metal alloying constituents to aluminum, which comprises;

blending a mixture of at least one particulate metal alloying material selected from manganese, chromium, and iron, substantially all of said metal having a particle size less than about 0.25 mm., with from about 0.1 to about 2.5 percent by weight of a non-hygroscopic salt fluxing agent selected from the group consisting of KBF_4 and $K_2Na_2Ba_3(SiF_6)_6$;

compacting the blended mixture into a coherent body; and

admixing the compacted mixture with the aluminum to be alloyed.

3,935,005
COMPOSITION AND METHOD FOR STRIPPING GOLD AND SILVER

Hamilton M. Solidum, North Attleboro, Mass., and Robert G. Zobbi, Southbury, Conn., assignors to American Chemical & Refining Company, Incorporated, Waterbury, Conn.

Filed Sept. 19, 1974, Ser. No. 507,333
Int. Cl.² C09K 13/00; C23F 3/04
U.S. Cl. 75—105 **11 Claims**

6. In the method of stripping gold and silver deposits from substrates, the steps comprising:

A. dissolving in water 7.5–60.0 grams per liter of a dry powder composition consisting essentially of, on a dry weight basis, 78.0–95.0 percent of a soluble cyanide compound selected from the group consisting of alkali metal cyanides, ammonium cyanide and mixtures thereof; 0.01–5.0 percent of a soluble lithium compound; 0.01–0.5 percent of an auxiliary agent comprising a soluble compound of a metal ion selected from the group consisting of lead, bismuth and mixtures thereof; and 5.0–22.0 percent of a water soluble, ring-substituted nitrobenzene acid compound selected from the group consisting of alkali metal and ammonium salts of methylnitrobenzoic acid, chloro-nitrobenzenesulfonamide, alkali metal and ammonium salts of amino nitrobenzoic acid, and alkali metal and ammonium salts of chloronitrobenzoic acid, said soluble lithium compound and auxiliary agent having non-interfering anions;

B. maintaining the aqueous solution resulting therefrom at a temperature of 18°–55° Centigrade;

C. immersing in said aqueous solution a workpiece having a deposit of a metal selected from the group consisting of gold and silver for a period of time sufficient to remove said deposit; and

D. rinsing said workpiece to remove said aqueous solution therefrom.

3,935,006
PROCESS FOR ELUTING ADSORBED GOLD AND/OR SILVER VALUES FROM ACTIVATED CARBON

Dennis D. Fischer, Laramie, Wyo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,941
Int. Cl.² C22B 11/00
U.S. Cl. 75—118 R **11 Claims**

1. A process for recovering gold and/or silver values from activiated carbon with gold and/or silver values adsorbed thereon, comprising eluting said activated carbon with an eluent selected from the group consisting of water soluble alcohols, solutions of water soluble alcohols and a strong base, aqueous solutions of water soluble alcohols, aqueous solutions of water soluble alcohols and a strong base, water soluble ketones and aqueous solutions of water soluble ketones.

3,935,007
ALUMINUM ALLOY OF AGE HARDENING TYPE

Yoshio Baba, Nagoya, and Mituhiro Kawai, Inazawa, both of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,534
Int. Cl.² C22C 21/16
U.S. Cl. 75—142 **4 Claims**

1. An aluminum alloy of age-hardening type consisting essentially of:

	weight percent
Cu	1.2 to 1.9
Mg	0.4 to 1.0
Si	0.3 to 0.8
V	0.01 to 0.16

and balance aluminum and inevitable impurities.

3,935,008

ELECTROPHOTOGRAPHIC PROCESS HAVING DEVELOPED HYDROPHILIC IMAGE AREAS

Erwin Lind, Auringen, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed June 21, 1973, Ser. No. 372,239

Claims priority, application Germany, June 23, 1972, 2230757

Int. Cl.² G03G *13/14*

U.S. Cl. 96—1.4 **15 Claims**

1. A process of forming an electrophotographic copy from an original which comprises uniformly charging a photoconductive hydrophobic material by means of a corona, imagewise exposing the photoconductive hydrophobic material in an exposure station, pre-developing the exposed charge image to a hydrophilic image by means of a two-component developer powder consisting of a hydrophilic solid substance and a carrier material, developing the hydrophilic image with an aqueous liquid into an aqueous image and transferring the aqueous image thus produced onto a copy receiving material.

3,935,009

ELECTROPHOTOGRAPHIC REPRODUCTION ELEMENT OF AN ANILINE COMPOUND ELECTRON ACCEPTOR

Gerardus J. Crommentuyn, Lottum, and Johannes H. A. Kuiper, Grubbenvorst, both of Netherlands, assignors to Océ-van der Grinten N.V., Venlo, Netherlands

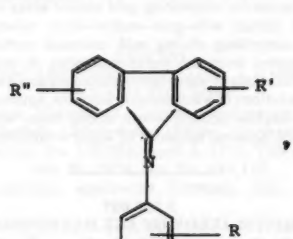
Filed Feb. 6, 1974, Ser. No. 440,245

Claims priority, application Netherlands, Feb. 14, 1973, 7302034

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 **16 Claims**

1. An electrophotographic reproduction element comprising a support having on it a photoconductive coating layer which contains a donor-acceptor complex formed of an electron donor having photo- or semiconductor properties and an electron acceptor, wherein the electron acceptor is a compound of the formula



in which R represents one or more moieties selected from the group consisting of hydrogen and halogen atoms and lower alkyl, lower alkoxy, nitro, cyano, carboxylic acid, carboxylic ester, sulfonic acid, sulfonic ester, alkylsulfinyl, alkylsulfonyl and trifluoromethyl substituents and R' and R'' each represents a hydrogen atom or one or more nitro groups but at least one of R' and R'' is not a hydrogen atom.

3,935,010

ELEMENT AND PROCESS FOR SELECTIVELY FORMING POSITIVE OR NEGATIVE PHOTOGRAPHIC IMAGES

Paul B. Gilman, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,682

Int. Cl.² G03C *5/04, 1/28, 1/365/30*

U.S. Cl. 96—27 E **15 Claims**

1. A photographic element capable of forming either a positive or a negative image, depending upon the choice of electromagnetic radiation wavelengths to which it is exposed, comprising

a support

and, as a coating thereon, a layer comprising

internally fogged photographic silver bromide grains which are substantially free of surface fog and, associated with the surface of said grains,

a desensitizer containing an imidazoquinoxaline nucleus having a reduction potential more positive than −0.90 volt and an oxidation potential more positive than +0.80 volt, said desensitizer being present in a desensitizing amount sufficient to cover no more than 25 percent of the surface of said silver bromide grains,

at least 0.5 times the amount of said desensitizer of a spectral sensitizing dye having an absorption peak at least 20 nm removed from any absorption peak exhibited by said desensitizer, and

said silver bromide grains being chosen so that prior to association with said sensitizing dye and desensitizer a test coating thereof with no image exposure and development for about 5 minutes at 20°C using Kodak Developer D-19 will provide a density of less than 0.4 and, when said test coating is developed, but with the developer containing 0.50 grams of potassium iodide per liter of developer, it will have a maximum density greater than 0.5.

10. A process of selectively forming either a positive or a negative photographic image comprising

providing as a coating of a photographic element a composition comprising (1) internally fogged photographic silver bromide grains which are substantially free of surface fog and, associated with the surface of said grains, (2) a desensitizing amount sufficient to cover no more than 25 percent of the surface of said silver halide grains of a desensitizer having a reduction potential more positive than +0.80 volt and (3) at least 0.5 times the amount of said desensitizer of a spectral sensitizing dye having an absorption peak at least 20 nm removed from any absorption peak exhibited by said desensitizer, said silver bromide grains being chosen so that prior to association with said sensitizing dye and desensitizer a test coating thereof with no image exposure and development for about 5 minutes at 20°C using Kodak Developer D-19 will provide a density of less than 0.4 and, when said test coating is developed, but with the developer containing 0.50 grams of potassium iodide per liter of developer, it will have a maximum density greater than 0.5;

selectively exposing said coating to electromagnetic radiation within a wavelength range within which the silver bromide grain surfaces are predominantly desensitized or

selectively exposing said coating to electromagnetic radiation within a wavelength range within which the silver bromide grain surfaces are predominantly sensitized;

and then developing with an internal image developer to form an image.

3,935,011
SYSTEM FOR MAKING COMPOSITE PHOTOMICROGRAPHS

Klaus P. Schindl, Wien, Austria, assignor to C. Reichert Optische Werke AG, Vienna, Austria

Filed Apr. 18, 1973, Ser. No. 351,913
Int. Cl.² G03C 5/04, 5/06
U.S. Cl. 96—41 1 Claim

1. A method of preparing composite photomicrographs comprising the steps of:

positioning a mask in the intermediate image plane of a microscope, said mask having a transparent portion and an opaque portion and said mask being optically aligned with the optical path of said microscope;

making a first exposure on a frame of a camera film plane through said microscope intermediate image plane;

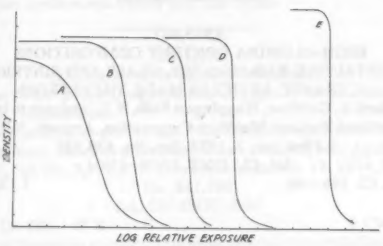
positioning a second mask in said intermediate image plane, said second mask having a transparent portion corresponding to the opaque portion of said first mask and an opaque portion corresponding to the transparent portion of said first mask and being located in optical, alignment on the optical path of said microscope; and

making a second exposure of the said frame, whereby a composite photograph of a single object is produced.

3,935,012
PHOTOSENSITIVE SHEET MATERIALS

Gilbert L. Elan, White Bear, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 12, 1973, Ser. No. 378,526
Int. Cl.² G03C 5/24, 1/00, 1/02
U.S. Cl. 96—48 R 13 Claims



1. Light-sensitive sheet material useful as an intermediate in forming a record of a light-image on a print sheet containing a second reactant which is reactive with a first reactant to provide a visible change; said intermediate sheet consisting essentially of a photolyzable heat-stable source of hydrogen halide, an acid-cleavable adduct of a said first reactant and an organic compound containing a vinyl ether linkage, said adduct being capable of supplying a reducing agent when cleaved with acid, and an acid acceptor for said hydrogen halide in an amount, between 0.01 and 2.0 moles per mole of said photolyzable source, less than sufficient to retain all of the hydrogen halide available from said photolyzable source upon exposure to said light image; wherein said acid acceptor is selected from the group consisting of:

a. nitrogen-containing organic compounds having at least one basic group and wherein the conjugate acid corresponding to each said group has a pKa value greater than 4.6, and

b. nitrogen-containing organic compounds having at least one basic group, wherein the conjugate acid corresponding to each said group has a pKa value greater than 3.3, and wherein said compound has no hydrogen-heteroatom bond with dissociation energy less than 85 kcal/mole.

13. Light-sensitive sheet material resistant to thermally induced degradation and containing as a photolyzable source of halogen free radicals an ester or urethane derivative or tribromoethanol.

3,935,013
ELECTROLESS DEPOSITION OF A COPPER-NICKEL ALLOY ON AN IMAGEWISE PATTERN OF PHYSICALLY DEVELOPABLE METAL NUCLEI

Mark Lelental, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

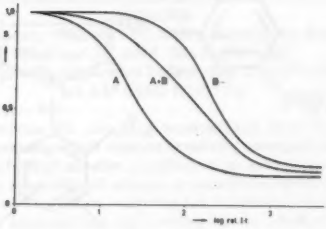
Filed Nov. 12, 1973, Ser. No. 415,459
Int. Cl.² G03C 5/24
U.S. Cl. 96—48 PD 19 Claims

1. A developed photographic element comprising a support having thereon physically developable metal nuclei in an imagewise pattern and an imagewise coating of a copper nickel alloy containing from 9 to 98 mole percent copper and from 2 to 91 percent of nickel based on total moles of copper and nickel said coating being formed by electroless deposition of said alloy onto said nuclei.

3,935,014
DIRECT-POSITIVE PHOTOGRAPHIC EMULSION CONTAINING, UNFOGGED, MONODISPERSED SILVER HALIDE GRAINS HAVING A LAYERED GRAIN STRUCTURE OF SPECIFIC SILVER CHLORIDE CONTENT

Sieghart Klötzer, and Erik Moisar, both of Cologne, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Feb. 14, 1974, Ser. No. 442,614
Claims priority, application Germany, Feb. 20, 1973, 2308239
Int. Cl.² G03C 5/24, 1/02
U.S. Cl. 96—64 13 Claims



1. A photographic material for producing direct-positive photographic images having at least one silver halide emulsion layer having unfogged and monodispersed silver halide grains having a layered grain structure wherein 95% by weight of the silver halide grains of the emulsions have a grain diameter which does not deviate by more than 40% from the average grain diameter and which grains are not or only slightly chemically sensitized at the surface wherein the improvement comprises the unfogged silver halide grains of the emulsion have at least two phases, a localized first phase of the silver halide grains has at least 20 mol percent of silver chloride based on the total mol percent of silver halide and a second phase of the silver halide grains has less silver chloride than said first phase and said silver halide grains contain not more than 30 mol percent of silver chloride based on the silver halide of said grains based on the total mol percent of silver halide, said silver halide grains when exposed for between 1/100 to 1 second and developed for 3 minutes at 20° C with an internal developer of the following description:

Hydroquinone	15 g
Monomethyl-p-aminophenolsulfate	15 g
Sodium sulfite (anhydrous)	50 g
Potassium bromide	10 g
Sodium hydroxide	25 g
Sodium thiosulfate (cryst.)	20 g
Water up to	1000 ml

provide a silver image of density which is at least three times that when similarly exposed and developed for 4 minutes at 20°C with a surface developer of the following composition:

p-Hydroxyphenylglycine	10 g
Sodium carbonate (cryst.)	100 g
Water up to	1000 ml.

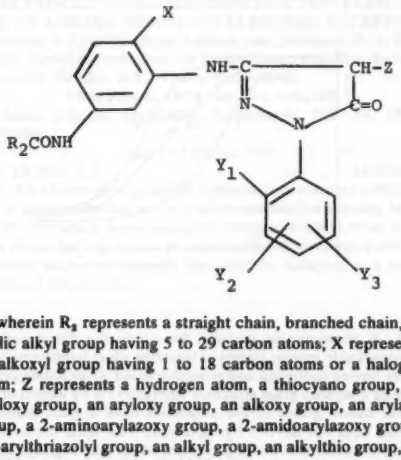
3,935,015

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS CONTAINING 3-ANILINO-5-PYRAZOLANE COUPLERS

Atsuaki Arai; Yasushi Oishi; Akio Okumura; Minoru Yamada; Yukio Yokota, and Kozo Inouye, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 22, 1974, Ser. No. 445,032
Claims priority, application Japan, Feb. 22, 1973, 48-21454
Int. Cl.² G03C *1/76, 1/40*
U.S. Cl. 96—74 **9 Claims**

8. A color photographic material comprising a support having thereon a green-sensitive silver halide emulsion layer containing a 3-anilino-5-pyrazolone magenta dye-forming coupler, a red-sensitive silver halide emulsion layer containing a cyan dye-forming coupler with a phenol or 1-naphthol nucleus, and a blue-sensitive silver halide emulsion layer containing a cyan dye-forming coupler with an acylacetamido group, said magenta dye-forming coupler having the general formula:



wherein R_1 represents a straight chain, branched chain, or cyclic alkyl group having 5 to 29 carbon atoms; X represents an alkoxyl group having 1 to 18 carbon atoms or a halogen atom; Z represents a hydrogen atom, a thiocyano group, an acyloxy group, an aryloxy group, an alkoxy group, an arylazo group, a 2-aminoarylazoxy group, a 2-amidoarylazoxy group, a 2-arylthriazolyl group, an alkyl group, an alkylthio group, an arylthio group, a cycloalkylthio group, a carbon-containing heterocyclic monothio group having a 5 to 6 membered ring containing at least one hetero nitrogen, oxygen or sulfur atom in which the heterocyclicmoieties of the monothio group are incapable of forming a chromophoric compound; Y_1 represents a halogen atom, an alkyl group, or an alkoxy group; and Y_2 and Y_3, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an aryloxy group, an alkoxycarbonyl group, an aralkoxycarbonyl group, a carboxyl group, a cyano group, a nitro group, or an acylamino group.

3,935,016

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS CONTAINING 3-ANILINO-5-PYRAZOLONE COUPLERS

Tokio Nishimura; Minoru Yamada; Hiroyuki Amano, and Yasushi Oishi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Company, Ltd., Minami-ashigara, Japan

Filed Apr. 15, 1974, Ser. No. 461,086
Claims priority, application Japan, Apr. 13, 1973, 48-41868
Int. Cl.² G03C *1/76, 1/40*
U.S. Cl. 96—74 **18 Claims**

1. A color photographic material comprising a support having coated thereon a silver halide emulsion layer containing a magenta dye forming coupler having a 3-anilino-5-pyrazolone ring and at least one hydrophobic residue of 8 to 32 carbon atoms, the ortho position of the anilino group at the 3-position of said pyrazolone ring being substituted with a halogen atom, an alkyl group, an alkoxyl group, an amide group, an aryl group, an aryloxy group, a cyano group, a nitro group, a hydroxyl group, or an amino group, and at least one of said silver halide emulsion layer and a hydrophilic colloic layer adjacent said silver halide emulsion layer containing a hydroquinone compound having at least one substituent of at least 8 carbon atoms or a hydroquinone precursor capable of providing said hydroquinone compound upon hydrolysis.

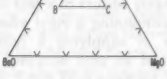
14. The color photographic material of claim 1, in which said photographic material comprises a support having thereon at least a green-sensitive silver halide emulsion layer, a differently sensitized silver halide emulsion layer, an a hydrophilic colloid layer present between said two silver halide emulsion layers, said green-sensitive silver halide emulsion layer containing said 3-anilino-5-pyrazolone type magenta dye forming coupler and said hydrophilic colloid layer containing said hydroquinone compound.

3,935,017

HIGH-ALUMINA CONTENT COMPOSITIONS CONTAINING BAO-MGO-SiO_2 GLASS AND SINTERED CERAMIC ARTICLES MADE THEREFROM

Richard A. Gardner, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,329
Int. Cl.² C04B *33/26, 35/04*
U.S. Cl. 106—46 **7 Claims**



1. A sintered alumina ceramic material sinterable in a reducing atmosphere without blistering or mottling consisting essentially of alumina and a pre-fused ternary glass sintering aid from the system:

$BaO\text{-}MgO\text{-}SiO_2$,

said sintered alumina ceramic material having a dielectric constant of at most 9.5, which permits adequate speeds upon use in computer circuitry, and a dissipation factor less than .005, said ternary glass sintering aid being se-

lected from compositions within the area bounded by A-B-C in the Figure, which points A-B-C represent the following compositions:

Point	Mol % BaO	Mol % MgO	Mol % SiO_2
A	15.0	15.0	70.0
B	43.5	17.5	39.0
C	17.5	43.5	39.0.

3,935,018
GLASSES

Neil Hunter Ray, and William Derek Robinson, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 12, 1973, Ser. No. 350,496
Claims priority, application United Kingdom, Apr. 27, 1972, 19560/72; Aug. 16, 1972, 38141/72
Int. Cl.² C03C *3/00*
U.S. Cl. 106—47 R **16 Claims**

1. An inorganic oxide glass having a mole % composition in the range

B_2O_3 1.2 to 3.5;
P_2O_5 50 to 72;
PbO 0 to 30;

at least one oxide selected from oxides of:

Cu, Ag, Au, Sc, Y, La, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th, Pd, and U, 0 to 5;

the glass containing in addition at least one oxide selected from alkali metal oxides and at least one oxide selected from alkaline earth metal oxides and zinc oxide.

3,935,019
GLASSES AND GLASS-CERAMICS

James Erich Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 349,152, April 9, 1973, abandoned, which is a division of Ser. No. 241,448, April 5, 1972, Pat. No. 3,852,077. This application Feb. 12, 1974, Ser. No. 441,790
Int. Cl.² C03C *3/00*
U.S. Cl. 106—47 R **5 Claims**

1. A thermally crystallizable glass suitable for crystallization to a glass-ceramic having good dielectric properties and an index of refraction in said glass-ceramic in excess of 2.000 and higher than the index of refraction of said glass, said glass consisting essentially of the following composition:

Ingredient	Mole Percent
GeO_2	35 – 60
Nb_2O_5	19 – 35
PbO	16 – 35

wherein the molar ratio of Nb_2O_5 to PbO ranges from about 0.9:1 to about 1.5:1.

3,935,020
FARADAY ROTATION GLASSES

Emil W. Deeg, Woodstock, Conn.; David A. Krohn, and Robert E. Graf, both of Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 24, 1974, Ser. No. 463,490
Int. Cl.² C03C *3/04, 3/08*
U.S. Cl. 106—54 **5 Claims**

1. A Faraday rotation glass exhibiting a high Verdet constant and low susceptibility toward devitrification consisting essentially of the following constituents as expressed in weight percent:

SiO_2	0–12
B_2O_3	10–42
Alkali metal oxide	0–1
Rare earth oxide	25–57
Alkaline earth oxide	8–24
ZrO_2	1–7
WO_3	0–7
Al_2O_3	0–2
Fining Agent	0–0.5

where the alkaline earth oxide is selected from the group consisting of CaO, BaO, ZnO, and combinations thereof, the rare earth oxide is selected from the group consisting of Tb_4O_7, and the combination of Tb_4O_7 and La_2O_3, the Tb_4O_7 being present in an amount of 20-45 weight percent, and the alkali metal oxide being selected from the group consisting of Na_2O, K_2O, and combinations thereof.

3,935,021
WATER-RESISTANT GYPSUM PRODUCTS

Dale R. Greve, Beaverton, Oreg., and Eugene D. O'Neill, Miami, Fla., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Nov. 5, 1973, Ser. No. 412,968
Int. Cl.² C04B *11/14*
U.S. Cl. 106—111 **27 Claims**

1. A composition, capable of being set by water into a water-resistant gypsum product, comprising gypsum, at least about 0.15 wt. % of polyvinyl alcohol and at least about 3 wt. % of wax-asphalt emulsion, wherein the total amount of said polyvinyl alcohol and said wax-asphalt emulsion present in the composition is such that the water-resistant properties of said gypsum product are greater than a gypsum product prepared from a like gypsum composition which contains one of said polyvinyl alcohol or said wax-asphalt emulsion in an amount the same as the figure of said total amount.

3,935,022
METHOD FOR THE REMOVAL OF HEMICELLULOSE FROM HEMICELLULOSE-CONTAINING CAUSTIC LIQUORS

Hannes Sihtola, Tilimaki 30A, 00330 Helsinki 33, Finland

Filed Apr. 26, 1974, Ser. No. 464,304
Claims priority, application Finland, July 23, 1973, 2313/73
Int. Cl.² C08L *1/24, 5/24*
U.S. Cl. 106—163 **16 Claims**

1. A process for removing hemicellulose from hemicellulose-containing alkali solution consisting essentially of adding to said alkali solution a sufficient amount of a solvent consisting essentially of ethanol to precipitate hemicellulose from said alkali solution, removing the precipitated hemicellulose from said solution and recovering the purified alkali liquor.

3,935,023
ALUMINA DISPERSIONS

Mahlon Robert Deroff, Blackwood, N.J., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation of Ser. No. 383,879, July 30, 1973. This application Oct. 8, 1974, Ser. No. 513,199
Int. Cl.² C08K *3/22*
U.S. Cl. 106—308 B **19 Claims**

1. A method of preparing stable aqueous dispersions of alumina at concentrations of about 18 to 26% Al_2O_3 onn a weight basis, consisting essentially of:

1. preparing an aqueous solution of hydrochloric acid,
2. controlling the temperature below the boiling point of the dispersion,
3. maintaining the pressure between 0.5 to 5 atmospheres,
4. adding alumina to said aqueous solution such that the weight ratio of alumina to HCl is 53 to 66 parts alumina to 1 part HCl and the Al_2O_3 is 18 to 26% of the total mixture, and

5. simultaneously agitating said mixture to obtain the desired dispersion.

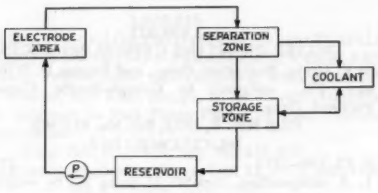
3,935,024
HALOGEN HYDRATES

Philip Charles Symons, Birmingham, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Continuation-in-part of Ser. No. 50,054, June 26, 1970, Pat. No. 3,713,888, and a continuation-in-part of Ser. No. 244,222, April 14, 1972, abandoned. This application Jan. 3, 1973, Ser. No. 320,806

Int. Cl. H01m *35/00*

U.S. Cl. 136—6 E **18 Claims**



1. A method for producing electric current from an electrical energy storage device having an electrode compartment means containing therein a positive electrode means and a negative electrode means comprised of a metallic surface, which will combine electrochemically with a halogen, comprising the steps of:

1. circulating an aqueous metal halide electrolyte solution sequentially past said electrode means in said electrode compartment means, externally of said electrode compartment means and back past said electrode means;
2. decomposing a halogen hydrate thereby producing its thermal decomposition products, namely halogen and water;
3. passing said decomposition products into said electrolyte while it is being circulated external to said electrode compartment thereby dissolving at least a portion of halogen from said halogen hydrate; and
4. completing the circuit between said positive and negative electrode means.

2. A method for producing electric current from an electrical energy storage device, having an electrode compartment means, containing therein, a positive electrode means, a negative electrode means comprised of a metallic surface which will combine electrochemically with a halogen and an ion permeable diaphragm mounted between said positive electrode means and said negative electrode means so as to provide a positive electrode compartment means and a negative compartment means comprising the steps of:

1. circulating an aqueous metal halide electrolyte solution sequentially past said negative electrode means in said electrode compartment means, externally of said electrode compartment means and back past said negative electrode means;
2. circulating an aqueous metal halide electrolyte solution sequentially past said positive electrode means in said electrode compartment means, externally of said positive electrode compartment means and back past said positive electrode means;
3. decomposing a halogen hydrate thereby producing its thermal decomposition products, namely, halogen and water;
4. passing said decomposition products into said electrolyte from said positive electrode compartment means while it is circulating external to said electrode compartment means thereby dissolving at least a portion of halogen from said halogen hydrate; and
5. completing the circuit between said positive and negative electrode means.

3,935,025
ELECTRIC STORAGE BATTERY PROVIDING HIGH ENERGY DENSITY

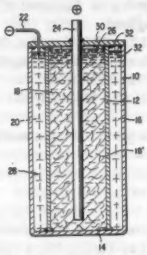
Martyn A. Cadman; Michel Voinov, and Helmut Tannenberger, all of Geneva, Switzerland, assignors to Etat Francais, Paris, France

Filed June 29, 1973, Ser. No. 375,092

Claims priority, application France, July 6, 1972, 72.24400

Int. Cl.² H01M *10/00*

U.S. Cl. 136—6 LN **19 Claims**



1. An electrical storage battery comprising an anode compartment containing at least one reducer metal, a cathode compartment containing an electrically conductive solution comprising at least one salt of said reducer metal in a non-aqueous solvent, at least one electron acceptor in solution in said electrically conductive solution, and a wall, sealed to fluids, for separating said compartments and comprising a solid material which permits the migration, at ambient temperature, of the reducer metal of the anode, in the form of ions, the said electron acceptor being soluble in the electrically conductive solution contained in the cathode compartment in the reduced state as well as the initial state thereof.

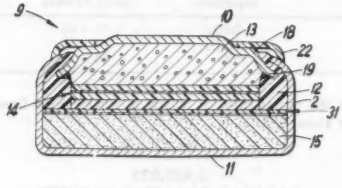
3,935,026
ENERGY CELL FOR WATCH

Paul L. Howard, Millington, Md., assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 14, 1975, Ser. No. 568,337

Int. Cl.² H01M *35/02, 43/02*

U.S. Cl. 136—20 **8 Claims**



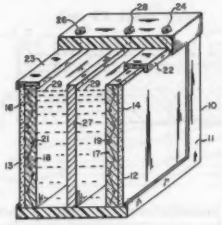
1. In an energy cell having a positive electrode, a negative electrode and an electrolyte, the improvement comprising:

a positive active material of said positive electrode consisting essentially of a mixture of divalent silver oxide and up to 20% by weight of a material from the group including sulfur and silver sulfide whereby the voltage level of the divalent silver oxide is depressed to a predetermined level without affecting the cell capacity, said voltage being maintained over substantially the entire life of the cell.

3,935,027
OXYGEN-REDUCTION ELECTROCATALYSTS FOR ELECTRODES

Charles J. Warde, and Albert D. Glasser, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1975, Ser. No. 566,491
Int. Cl.² H01M 4/58, 4/86, 8/00
U.S. Cl. 136—86 A 10 Claims



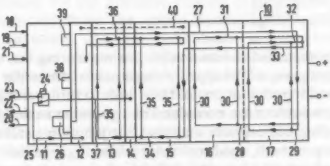
1. A gas electrode containing a hydrophilic layer comprising:

1. a composite adapted to provide a gas-liquid interface therein containing:
   i. an oxygen absorption/reduction electrocatalyst selected from the group consisting of $CaMnO_3$ and $Ca_{(1-x-z)}M-nO_3$: Na_x, Y_z, where x and z can range from about 0.05 to 0.40; and
2. a metal current collector.

3,935,028
FUEL CELL SET AND METHOD

Karl Strasser, and Dieter Hasenauer, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 261,250, June 9, 1972, abandoned.
This application Sept. 23, 1974, Ser. No. 508,646
Claims priority, application Germany, June 11, 1971, 2129134
Int. Cl.² H01M 8/04, 8/06
U.S. Cl. 136—86 C 12 Claims



1. A fuel cell set for the generation of electric energy through the reaction of gaseous reactants and a liquid electrolyte which is circulated, the fuel cell set comprising:

a housing of compact construction;

a plurality of fuel cells which are combined into at least one fuel cell battery disposed within said housing;

an electrolyte regenerator, disposed adjacent said fuel cells within said housing, which removes reaction water from the electrolytic liquid, said electrolyte regenerator including a plurality of water depletion units each comprising an electrolyte chamber, a condensation chamber, an asbestos diaphragm which separates said electrolyte chamber from said condensation chamber, a cooling chamber, and a non-porous condensation surface which separates the cooling chamber from said condensation chamber, and said electrolyte chambers of said water depletion units being coupled by an electrolyte flow line to the electrolyte chambers of said fuel cells;

a pressure lock, disposed adjacent said regenerator within said housing through which the reaction water flows, said pressure lock comprising a gas chamber, a liquid chamber, and a liquidpermeable asbestos diaphragm which separates the liquid chamber from said gas chamber, and said pressure lock gas chamber being coupled to said electrolyte regenerator condensation chambers;

a heat exchanger, disposed adjacent said pressure lock within said housing, having a coolant which removes heat from the electrolyte and cooling chambers, said heat exchanger electrolyte chambers being coupled to said electrolyte regenerator electrolyte chambers;

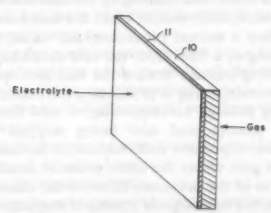
a supply tank for the electrolytic liquid disposed adjacent said heat exchanger and coupled by a plurality of electrolyte flow lines to the electrolyte chambers of said electrolyte regenerator and said fuel cells within said housing; and

a control unit, disposed adjacent said tank within said housing, which controls the flow of gaseous reactants, electrolytic liquid and reaction water and through which the gaseous reactants and coolant are supplied to and discharged from said fuel cell set, said gaseous reactants and said coolant being supplied to and discharged from said fuel cells and said heat exchanger, respectively, on the side of said fuel cell set on which said control unit is disposed, said control unit including valve means, coupled to said pressure lock and supply tank for controlling the reaction water discharge flow and returning said reaction water to said supply tank thereby controlling the electrolyte concentration; a pump for pumping said electrolyte through said fuel cell set; a pneumatic valve to allow hydrogen to flow to the electrolyte regenerator upon starting the fuel cell set; a control line, magnetic valve and reducing valve through which the hydrogen flows to the electrolyte regenerator; feed lines for the oxygen and hydrogen reactants; an oxygen diaphragm valve in the feed line for the oxygen; a hydrogen diaphragm valve in the feed line for the hydrogen; a choke which opens the oxygen diaphragm valve later than the hydrogen diaphragm valve; discharge lines for the oxygen and hydrogen residue; an oxygen discharge valve in the discharge line for the oxygen residue; and a hydrogen discharge valve in the discharge line for the hydrogen residue.

3,935,029
METHOD OF FABRICATING A CARBON - POLYTETRAFLUOROETHYLENE ELECTRODE - SUPPORT

Bernard Baker, Brookfield Center, and Martin Klein, Brookfield, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Continuation of Ser. No. 200,052, Nov. 18, 1971. This application Feb. 19, 1974, Ser. No. 443,209
Int. Cl. H01m 13/04
U.S. Cl. 136—121 3 Claims



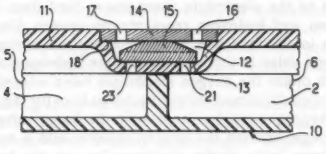
1. A method for the manufacture of an electrically conductive substrate for use as an electrode support in a fuel cell comprising the steps of:

a. blending a quantity of carbon with dry powdered polytetrafluoroethylene in a lubricant to form a homogeneous mixture, said polytetrafluoroethylene constituting from 6 percent to no more than 32 percent of the combined weight of said carbon and said polytetrafluoroethylene;
b. filtering lubricant from said blend to form a filtered mixture;
c. subjecting said filtered mixture to rolling forces effecting thickness reduction thereof, thereby forming a sheet of fibrillated polytetrafluoroethylene containing carbon and lubricant; and
d. removing the remainder of said lubricant from said sheet.

3,935,030
VALVE MEANS FOR AN ELECTROCHEMICAL STORAGE CELL OR THE LIKE

Francis Sperandio, Le Bouscat, France, assignor to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Mar. 13, 1975, Ser. No. 558,176
Claims priority, application France, Mar. 21, 1974, 74.09705
Int. Cl.² H01M 2/12
U.S. Cl. 136—170 5 Claims

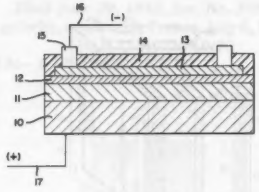


1. Valve means comprising a chamber freely communicating with a first venting space and having a passage communicating with a second space and an elastically deformable part contained in the chamber, said part stopping up the communicating passage between the chamber and the said second space when an excess pressure prevails in the second space in relation to the pressure prevailing in the chamber is lower than a first determined value, and opening up the said communicating passage by elastic deformation when the said excess pressure is higher than a second predetermined value, thus enabling the escaping of a fluid from the said second space via said communicating passage toward the said first space, the said chamber communicating with at least a third space having a communicating passage corresponding to said first-named communication passage and also being stopped up and opened up by the responsive deformation of the said elastically deformable part under the same pressure conditions in said third space as of the pressures between the chamber and the second space, the opening and closing of respective of said communicating passages by said part being independent of pressure conditions in respective of said second and third spaces.

3,935,031
PHOTOVOLTAIC CELL WITH ENHANCED POWER OUTPUT

Alan D. Adler, West Redding, Conn., assignor to New England Institute, Inc., Ridgefield, Conn.

Filed May 7, 1973, Ser. No. 357,852
Int. Cl. H01v 1/28
U.S. Cl. 136—206 13 Claims

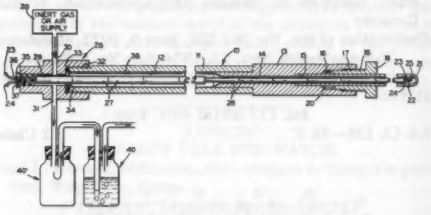


1. An article of manufacture comprising a photovoltaic cell having a layer of at least one porphyrinic compound deposited on an exposed semiconductor surface thereof, said layer being at least as thick as a monomolecular layer of said porphyrinic compound.

3,935,032
SHEATHED THERMOCOUPLE

Raymond L. Brandeberry, Toledo; Glen J. Lehr, Oregon, and Denzil W. Stacy, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 15, 1973, Ser. No. 416,017
Int. Cl.² G01K 7/00
U.S. Cl. 136—230 7 Claims

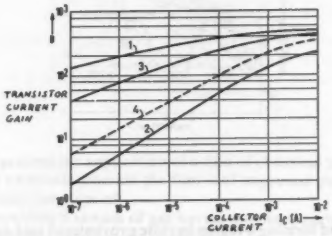


1. In a sheathed thermocouple for measuring the temperature of hot gases of the type having a pair of dissimilar conductors joined together at one of their ends to form a hot junction, which conductors are contained in a chamber sealed from the surrounding atmosphere and said hot junction extends into a refractory sheath, said refractory sheath together with an elongated tubular housing defining the sealed chamber, the tubular housing being provided with a hot and a cold end, and the hot end of the housing having an elongated bore for telescopically receiving the open end of the sheath, the improvement comprising:
a. connecting means detachably and sealingly attaching the open end of said sheath in the bore provided in the hot end of said tubular housing for forming one end of said chamber;
b. seal means attached to the cold end of said tubular housing for forming the other end of the chamber and including means to sealingly pass the conductors therethrough; and
c. means for pressurizing and maintaining a positive pressure in the chamber defined by said sheath and said tubular housing for preventing the hot gases being measured from penetrating said sheath and deteriorating said hot junction of said thermocouple.

3,935,033
METHOD OF IMPROVING THE RADIATION RESISTANCE OF SILICON TRANSISTORS WITH A SILICON OXIDE COATING

Rudolf Bauerlein, and Dieter Uhl, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Division of Ser. No. 162,439, July 14, 1971, Pat. No. 3,829,961. This application Nov. 15, 1973, Ser. No. 416,252
Claims priority, application Germany, July 18, 1970, 2035703
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 6 Claims



1. A method of improving the radiation resistance of silicon transistors with a silicon oxide coating, comprising the steps of irradiating a semiconductor device having a silicon oxide coating with electrons at an energy below 150 keV and a dose between 10^9 and 10^{12} rad at the boundary layer between the silicon and silicon oxide coating; and maintaining the temperature of the semiconductor device at a temperature of between 150° and 450°C during irradiation thereof.

3,935,034
BORON DIFFUSION COATING PROCESS

William J. Hayes, Shelby, Mich., assignor to Howmet Corporation, Greenwich, Conn.

Division of Ser. No. 220,477, Jan. 24, 1972, abandoned. This application July 3, 1974, Ser. No. 485,528
Int. Cl.² C23F 7/00
U.S. Cl. 148—6 8 Claims

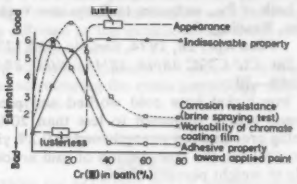
1. A process for the diffusion coating of a cemented metal carbide selected from the group consisting of carbides of tungsten, tantalum, titanium, columbium, molybenum, vanadium, chromium, zirconium, silicon and hafnium, comprising the steps of packing the cemented carbide in a powder consisting essentially of boron and a refractory salt or oxide selected from the group consisting of aluminum oxide, silica, zirconium oxide, and mixtures thereof, with the boron constituting from 0.2 to 15% by weight of the total weight of the boron and the refractory oxide or salt, and heating the pack to a temperature within the range of 1350° to 2500°F to diffusion coat the metal carbide.

3,935,035
AQUEOUS SOLUTION AND METHOD FOR SURFACE TREATMENT OF METALS

Tadashi Tanaka, Yokohama; Joji Oka, Tokyo, and Katushi Saito, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed May 31, 1974, Ser. No. 475,302
Claims priority, application Japan, June 5, 1973, 48-63228; Jan. 22, 1974, 49-9630
Int. Cl.² C23F 7/26
U.S. Cl. 148—6.2 11 Claims

1. An aqueous solution for treatment of metal surfaces which has a pH value greater than 7, and consists essentially of 0.01 to 10% by weight, estimated as Cr, of a chromium compound in which 5 to 40% of the initial quantity of Cr(VI)

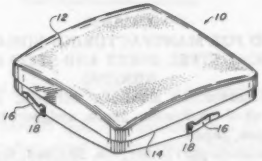


is reduced by reaction with a trifunctional phenol and which possesses no free inorganic acid.

3,935,036
METHOD OF FORMING A DARK, VERY ADHERENT COATING ON A CRT MASK ASSEMBLY

Frank Joseph Kinsch, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 19, 1974, Ser. No. 443,564
Int. Cl.² C23F 7/02
U.S. Cl. 148—6.16 6 Claims



1. A method of forming a dark, adherent coating, primarily of black iron oxide, on a mask assembly having exposed steel surfaces for use in a cathode ray tube bulb, said method comprising:

applying a solution of chromic and phosphoric acid to the exposed steel surfaces of the mask assembly for reaction therewith so as to generate a preliminary protective coating on said exposed surfaces, the ratio of chromic acid to phosphoric acid being approximately 4 to 1 over a range of concentration of phosphoric acid from about 0.5% to 2% by weight;

rinsing the mask assembly to substantially remove therefrom that portion of the acid which did not react with the mask assembly;

inserting the mask assembly into a cathode ray tube bulb; and

baking the mask assembly and the bulb so as to convert said preliminary coating to an adherent, dark coating consisting primarily of black iron oxide over the surface of the mask assembly.

4. A method of producing a dark, adherent coating, primarily of black iron oxide on a steel cathode ray tube mask assembly which has been re-etched to enlarge its apertures, said method comprising:

spraying the mask assembly with a hot solution of chromic and phosphoric acid, the ratio of chromic acid to phosphoric acid being approximately 4 to 1 over a range of concentration of phosphoric acid from about 0.5% to 2% by weight;

rinsing the excess solution from the mask assembly with a spray of deionized water;

drying the mask assembly;

inserting the mask assembly into its mating front panel;

mating the front panel with a cathode ray tube funnel;

baking the assembled cathode ray tube panel, mask assembly and funnel at approximately 435°C.

3,935,037
AUSTENITIC IRON-NICKEL BASE ALLOY

Donald R. Muzyka, Reinholds, and Ronald C. Gebeau, West Lawn, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Apr. 18, 1974, Ser. No. 462,127
Int. Cl.² C22C *38/44, 38/46, 38/50, 38/54*
U.S. Cl. 148—38 **10 Claims**

1. An iron-nickel base cold worked and precipitationed strengthened article subjected to less than 20% cold work before being precipitation strengthened to 0.2% yield strength of at least 180 ksi, the composition of said article consisting essentially in weight percent of about

Carbon	0.10 Max.
Manganese	2 Max.
Silicon	1 Max.
Phosphorus	0.04 Max.
Sulfur	0.03 Max.
Chromium	13.5–16
Nickel	24–28
Molybdenum	1–1.75
Titanium	1.6–2.7
Columbium	0.7–1.2
Vanadium	0.5 Max.
Aluminum	0.35 Max.
Boron	0.001–0.01
Copper	0.5 Max

3,935,038
METHOD FOR MANUFACTURING NON-ORIENTED ELECTRICAL STEEL SHEET AND STRIP HAVING NO RIDGING

Yoshiaki Shimoyama; Kunisuke Miyoshi, and Hiroyuki Kimura, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Japan

Continuation-in-part of Ser. No. 503,868, Sept. 6, 1974, abandoned, which is a continuation of Ser. No. 301,221, Oct. 26, 1972, abandoned. This application Dec. 3, 1974, Ser. No. 529,099
Claims priority, application Japan, Oct. 28, 1971, 46-85752
Int. Cl.² H01F *1/04*
U.S. Cl. 148—110 **2 Claims**

1. In a method for manufacturing non-oriented electrical steel sheet and strip wherein molten silicon steel is cast into a slab which is hot rolled, cold rolled, and annealed, the improvement which comprises controlling the composition of the steel so that the composition at the time of hot rolling comprises

C < 0.06%
Si = 1.5 to 4.0%
Al < 1.0%,
Si + Al 2.0%, and
C > 1/100 (Si + Al) − 0.75%,

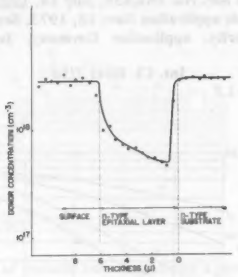
with the remainder being iron and unavoidable impurities, such that the sheet possesses ridging having undulations of not more than about 7 microns.

3,935,039
METHOD OF MANUFACTURING A GREEN LIGHT-EMITTING GALLIUM PHOSPHIDE DEVICE

Tatsuro Beppu, Tokyo; Masami Iwamoto, Yokohama, and Tetsuo Sekiwa, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 3, 1974, Ser. No. 457,649
Claims priority, application Japan, Apr. 4, 1973, 48-38483
Int. Cl.² H01L *7/38*
U.S. Cl. 148—171 **7 Claims**

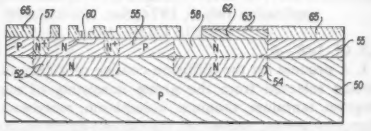
1. A method of manufacturing a green light-emitting gallium phosphide device which comprises the steps of adding nitrogen from a nitrogen compound to a liquid-phase epitaxial solution maintained at a higher temperature than 1030°C; precooling said solution to a temperature of 600° to 1000°C; bringing said precooled solution into contact with a substrate of gallium phosphide having the same conductivity type as said solution; cooling said solution for the formation of a nitrogen-containing liquid-phase epitaxial layer on said substrate; and forming a region in close proximity to said epitaxial layer with the opposite conductivity type thereto.



3,935,040
PROCESS FOR FORMING MONOLITHIC SEMICONDUCTOR DISPLAY

Donald R. Mason, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 190,778, Oct. 20, 1971, Pat. No. 3,766,447. This application June 13, 1973, Ser. No. 369,422
Int. Cl.² H01L *21/205, 21/84, 29/26*
U.S. Cl. 148—175 **8 Claims**



1. A method of fabricating a monolithic semiconductor display in a single crystal silicon substrate comprising:

epitaxially depositing on a plurality of selected regions of a surface of said silicon substrate a thin layer of an alloy of silicon to form a graded layer on each selected region having a crystal lattice constant substantially matching the crystal lattice constant of said silicon substrate at the boundary therebetween and having a crystal lattice constant substantially matching the crystal lattice constant of a preselected electroluminescent single crystal semiconductor material at a second surface;

thereafter epitaxially depositing a layer of said preselected electroluminescent semiconductor material on each of said thin layers;

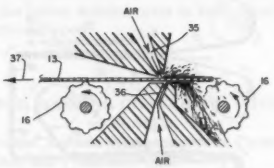
forming a planar p-n junction in each of said layers of electroluminescent semiconductor material to form a plurality of light emitting diodes for said display; and

forming p-n junctions in said substrate and said graded epitaxial layer to form an active semiconductor component different from said light emitting diodes.

3,935,041
METHOD FOR TREATMENT FLUID APPLICATION AND REMOVAL

Daniel L. Goffredo, Riverton, N.J., and Conrad Dale Shakley, Spring Mills, Pa., assignors to Chemcut Corporation, State College, Pa.

Continuation-in-part of Ser. No. 189,895, Oct. 18, 1971, Pat. No. 3,801,387. This application Jan. 2, 1974, Ser. No. 430,197
Int. Cl.² B08B 7/04; B05C 5/00; C23F 1/00; G03C 5/24
U.S. Cl. 156—18 23 Claims



1. A process for application of a film of chemical treatment fluid to an article wherein the film is of improved uniformity, comprising the steps of:

A. providing a stream of gas having atomized particles of a treatment fluid entrained therein;

B. moving said article along a predetermined generally planar path through a chamber; and

C. exposing said article to said stream of gas by blowing a thin stream of said gas directly thereon across the path, through gas knife means that extend across the path, whereby a thin film of said entrained treatment fluid is applied directly to said article, while the article is moving along its generally planar path.

3,935,042
METHOD OF MANUFACTURING CORONA-RESISTANT ETHYLENE-PROPYLENE RUBBER INSULATED POWER CABLE, AND THE PRODUCT THEREOF

Ralph E. Wahl, Trumbull, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 486,523, July 8, 1974, Pat. No. 3,878,319. This application Jan. 23, 1975, Ser. No. 543,335
Int. Cl.² H01B 9/02
U.S. Cl. 156—56 15 Claims

1. A method of manufacturing electric power cable comprising an assemblage of a conductor with a composite covering thereabout including a dielectric insulation of a thermoset ethylene-propylene rubber compound, a semiconductive layer overlying the dielectric insulation, and an enclosing jacket of a thermoset polychloroprene, comprising the steps of:

a. forming a dielectric insulating body of a curable ethylene-propylene rubber compound about a metallic electrical conductor, and curing the ethylene-propylene rubber of said insulating body;

b. heating the cured ethylene-propylene rubber compound insulating body about the conductor to a temperature of at least about 200°F;

c. applying a vapor-permeable, semiconductive adhering coating over the surface of said cured and heated insulating body of ethylene-propylene rubber compound;

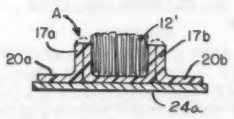
d. applying a layer of semiconductive material overlying the coating adhered to the surface of the cured and heated insulating body; and

e. forming an enclosing protective jacket of a heat-curable polymer surrounding the cable assemblage and heat curing the polymer.

3,935,043
METHOD OF MAKING WALL-REINFORCED WEATHERSTRIP

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Filed July 24, 1974, Ser. No. 491,523
Int. Cl.² E06B 7/16; B32B 5/00
U.S. Cl. 156—72 2 Claims



1. Method of making pile weatherstrip comprising the steps of

a. applying parallel spaced continuous lines of piling to a continuous base sheet of thin flexible material,

b. cutting the sheet between lines of piling to leave strips of the base material with one or more continuous lines of piling running along each strip, and the base sheet material extending out on each side from each line of piling,

c. folding a portion of the bare base sheet material of the strip back on itself beside a line of said piling to form an upstanding wall of folded base sheet material alongside and adjacent to the line of pile, with the remainder of said base sheet material lying flat in its original plane and extending out away from the line of piling to form a retaining edge portion for the weatherstrip,

d. fastening a backing support strip to the bottom of the weatherstrip,

e. cutting the top edge of said upstanding wall of folded base sheet material along its top fold line to thus provide two upstanding walls of the base sheet material capable of spreading apart and thus providing two sealing edges instead of one.

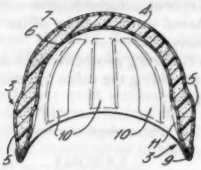
3,935,044
METHOD OF MANUFACTURING IMPROVED PROTECTIVE HEADGEAR

Noel Daly, 41A Young St., New Plymouth, New Zealand

Division of Ser. No. 246,581, April 24, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,397
Claims priority, application New Zealand, Dec. 23, 1971, 165908
Int. Cl.² B32B 5/20
U.S. Cl. 156—79 7 Claims

1. A method of producing a protective helmet comprising placing an inner shell having a dome portion and downwardly extending side portions on a die, positioning a further die so that a cavity is provided between the outer surface of the inner shell and the further die, filling the cavity with prefoamed beads of polystyrene of selected density, applying direct steam heat to said beads to expand said beads and create a continuous homogeneous layer of shock absorbing material extending

over the whole outer surface of the inner shell and physically adhered to it, and removing the inner shell with the adhered



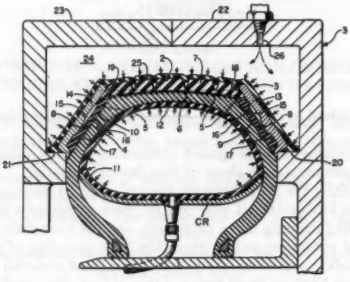
layer of shock absorbing material from said die and said further die.

3,935,045

METHOD OF RETREADING A TIRE

Merritt W. Wolfe, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 26, 1973, Ser. No. 409,995
Int. Cl.² B29H 5/04, 17/16
U.S. Cl. 156—96 **12 Claims**



1. A method of full-capping a tire comprising:
a. buffing a tire casing to remove at least a portion of the worn tread and at least one upper sidewall of the tire casing;
b. positioning a previously molded and vulcanized tread in surrounding relation around the tire casing, the precured tread extending beyond the buffed upper sidewall of the tire casing;
c. interposing a heat-curable material between the precured tread and tire casing for bonding the tread to the casing;
d. placing unvulcanized elastomeric material against the precured tread and buffed upper sidewall of the tire casing; and
e. contacting the unvulcanized elastomeric material with a molding device to form a pattern of ribs and grooves in the unvulcanized elastomeric material while simultaneously heating the bonding and unvulcanized elastomeric material to temperatures sufficient to cause curing of the bonding material and vulcanization of the elastomeric material.

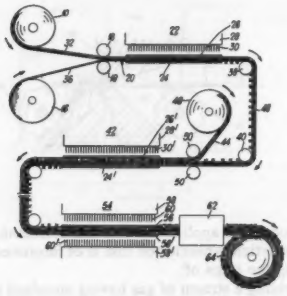
3,935,046

NON-WOVEN FABRICS

Geoffrey Poulter Kiernan, Cockermouth, and William Tinkler, Workington, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 6, 1972, Ser. No. 303,958
Int. Cl.² D04H 1/48
U.S. Cl. 156—148 **12 Claims**

1. A process for producing a non-woven fabric having a textured surface, comprising:
forming a first non-woven web of fibers at least 5% by weight of which are potentially adhesive,
superimposing said first web on a scrim fabric, and
passing said first web and scrim through a needle loom containing coarse gauge needles whereby fibers of said first web are needle punched through the scrim,
needle punching fibers of a second non-woven web with coarse gauge needles on to the scrim side of the web-scrim assembly to carry fibers from said second web



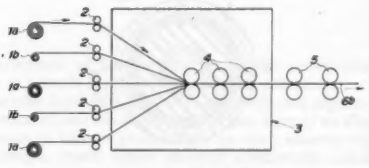
through said scrim and said first web to form large tufts on the surface of said first web,
subsequently needle punching the assembly with fine gauge needles from both sides thereby forming intermingled tufts of fibers of said first and second non-woven web on the surface of said first non-woven web, and
finally treating the assembly to render adhesive the potentially adhesive fibers so as to form bonds between contiguous fibers.

3,935,047

PROCESS FOR THE PREPARATION OF A SYNTHETIC WOOD

Toshihiko Shinomura, Yokohama, Japan, assignor to Nippon Oil Company Ltd., Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,236
Claims priority, application Japan, May 17, 1973, 48-54122; May 17, 1973, 48-54123; May 17, 1973, 48-54124
Int. Cl.² B32B 31/12; C09J 7/00
U.S. Cl. 156—163 **8 Claims**



1. A process for the preparation of a synthetic wood comprising the steps of:
fusion mixing a composition consisting essentially of 100 parts by weight of a thermoplastic resin and 5 – 400 parts by weight of an inorganic particulate filler to form a mixture thereof, the thermoplastic resin being selected from the group consisting of homopolymers of the monomers ethylene, propylene, styrene, vinyl chloride and vinylidene chloride, copolymers of at least two of said monomers, blends of said homopolymers and said copolymers, and mixtures of rubber with said homopolymers and said copolymers

molding the mixture into sheets, having a thickness of at least 0.5 mm,

drawing the sheets only monoaxially and to an extent that a drawing ratio of 50 – 1500% is attained,

heating the drawn sheets for a time sufficient to permit their surfaces to be heated to temperatures not lower than the melting point of the sheets while their interior remains at a temperature lower than said melting point,

superposing the thus heated drawn sheets one upon another,

fusion bonding the thus heated, superposed sheets together, and

allowing the fusion bonded mass to cool thereby obtaining the synthetic wood.

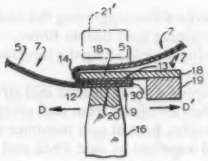
3,935,048
METHOD FOR FORMING CONTAINERS WITH FIN-TYPE SEAMS

George I. Rucker, Dublin, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Division of Ser. No. 327,476, Jan. 29, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,437

Int. Cl.² B29D 23/10

U.S. Cl. 156—203 8 Claims



1. The method of forming a heat sealed fin-type seam on tubed bag forming sheet material having heat sealable material on a face thereof, which comprises continuously moving the tube in an axial direction with the heat sealable material on the inside of the tube, while thus moved continuously folding one edge portion of the sheet back over the body of the tube, simultaneously overlapping the opposite edge portion of the sheet over the folded edge portion to form said fin, providing between said fin and the body of the tube a backup plate over which the fin can ride, continuously heat sealing said edge portions together by pressure application of a heated die against said overlapped edge portion whereby said folded edge portion engages said plate, and maintaining tracking alignment of said fin on said plate by continuously applying a pulling force on said fin in a direction toward the edge of the fin.

3,935,049
METHOD OF COVERING A SUBSTRATE BY OVERIDGE BONDING OF A COVERING MATERIAL ABOUT THE EDGES OF THE SUBSTRATE

Robert L. Schmidt, and Hubert J. Beckman, both of St. Charles, Ill., assignors to Ashland Oil, Inc., Ashland, Ky. and Riverside Laboratories, Inc., Geneva, Ill.

Filed July 15, 1974, Ser. No. 488,875

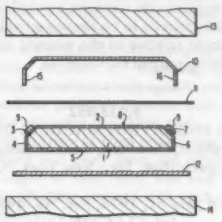
Int. Cl.² E04B 2/00; B32B 3/04, 27/12, 31/04

U.S. Cl. 156—216 12 Claims

1. Process for preparing a laminate from a rigid sheet and a resin-impregnated covering material wherein the covering material is to be bonded to a broad flat side of said sheet, the improvement which comprises:

A. applying a preformed strip of heat moldable resin along at least one of the thin sides bordering and adjacent to a broad flat side of a support substrate sheet;

B. positioning a resin-impregnated covering material over said flat side, said covering material extending beyond said strip of heat moldable resin; and



C. hot pressing said covering material with unidirectional compressive forces against said broad flat surface of said sheet and over said heat moldable resin, thereby simultaneously laminating said at least one of the thin sides and the broad flat surface.

3,935,050
METHOD OF MAKING A FUEL CELL

Marvin T. Conger, Akron; Theodore A. Evans, Uniontown, and Herbert F. Villemain, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 13, 1973, Ser. No. 396,957

Int. Cl.² B29C 1/14

U.S. Cl. 156—242 2 Claims

1. A method of building an elastomeric fabric container comprising building a fluorocarbon elastomeric inner liner on a building form, applying a solvent solution of a fluorocarbon elastomer coating over the inner liner and laying up fabric over the coating while the coating is sufficiently fluid to strike through the fabric, to give at least one layer of fabric, covering the fabric with at least one coat of a fluorocarbon elastomer and curing the elastomer to give a finished container after removal of the building form.

3,935,051
POLYURETHANE COMPOSITION AND LAMINATES MADE THEREWITH

Newell R. Bender, Cuyahoga Falls, and William M. Larson, Hudson, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 217,230, Jan. 12, 1972, Pat. No. 3,812,003, which is a continuation-in-part of Ser. No. 9,131, Feb. 11, 1970, abandoned, which is a continuation of Ser. No. 833,855, May 29, 1969, abandoned, which is a continuation of Ser. No. 360,753, April 17, 1964, abandoned. This application Feb. 21, 1974, Ser. No. 444,210

Int. Cl.² C09J 3/00, 5/00

U.S. Cl. 156—331 9 Claims

1. A method of forming a polyester fiberglass laminate that requires a pull in excess of 60 pounds per square inch to separate the polyester fiberglass laminate consisting of spreading an adhesive on the surface of the polyester fiberglass specimen and bringing said specimen into laminating relationship with a second specimen until the adhesive has set, said adhesive consisting essentially of a reaction mixture

1. of 100 parts of a reactive hydrogen containing polymeric material having a molecular weight of about 700 to 4500 selected from the class consisting of polyester polyols, polyether polyols and polyester amides,
2. about 38 to 80 parts of an organic polyisocyanate,
3. at least 5 parts to no more than about 200 parts of an inert powdery filler with the proviso that in no case shall the amount of filler exceed that amount which when mixed with a hundred parts of the reactive hydrogen

containing polymeric material renders the resulting mixture unspreadable,

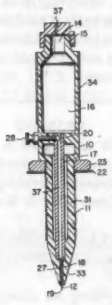
4. sufficient catalyst to achieve set of the reaction mixture in at least a quarter of an hour at about 75°F., and
5. sufficient monomeric nitrogen containing polyol having from 3 to 6 hydroxyls to be about equivalent to the excess polyisocyanate relative to the amount of reactive hydrogen containing polymeric material.

3,935,052

ACID ENGRAVING MACHINE DEVICE

Hendrik J. Vernhout, Hamilton, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 31, 1974, Ser. No. 493,470
Int. Cl.² C23F *1/02*
U.S. Cl. 156—345 **1 Claim**



1. A pen device for use in engraving, adaptable for mounting in an arm of a pantograph, said device incorporating a housing body comprising:

an internal refillable acid reservoir,

a hollow axial tube leading from the acid reservior to a pen member which projects through an end tip of the device,

said pen member being in the form of a hollow tube fitted at its external end with a rollable stainless steel ball, with

a valve member in the form of a screw that is mounted transversely to the said hollow axial tube, said screw extending externally of the device and threaded in the housing so as to extend beyond the periphery of the housing, in which the acid reservoir is open at an end of the housing and is covered by a removable threaded cap, said cap fitted with a vent hole,

said housing body fitted with means to attach to the arm of a pantograph.

3,935,053

PROCESS FOR PREPARING THERMOSETTING LAMINATES

Rudolph J. Armstrong, Jr., Hempstead, N.Y., assignor to Photocircuits Corporation, Glen Cove, N.Y.

Division of Ser. No. 819,093, April 24, 1969, Pat. No. 3,600,247, which is a continuation-in-part of Ser. No. 680,983, Nov. 6, 1967, abandoned. This application Oct. 16, 1970, Ser. No. 69,522
Int. Cl.³ G01N *27/00*; G01R *27/14*
U.S. Cl. 156—378 **5 Claims**

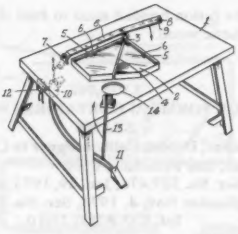
1. In a laminating press for heating and laminating with thermosetting resins the improvement which comprises electrical sensing means for measuring the electrical properties of the gel stage of the thermosetting resin of a heated thermosetting laminating assembly as said resin is heated and means for applying pressure to said press when said electrical sensing means measures the gel stage to thereby thermoset the laminated assembly in said press.

3,935,054

APPARATUS FOR MANUFACTURING NECK-TIES

David Hirschson, 25 Linksfield Drive, Johannesburg, South Africa (2001)

Division of Ser. No. 137,446, April 26, 1971, Pat. No. 3,842,436. This application July 25, 1974, Ser. No. 491,629
Claims priority, application South Africa, Apr. 24, 1970, 70/2749
Int. Cl.² B29H *7/04*; A41H *33/00*
U.S. Cl. 156—443 **4 Claims**



1. Apparatus for securing a lining in an end of a neck-tie comprising;

a supporting surface for supporting the end of a strip of tie material containing heat fusible fibres,

means for forming a pleat along the longitudinal axis of said strip of tie material,

means foı clamping a lining against said strip of tie material along two lines diverging from said pleat, and

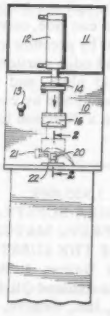
means for providing heat at said two-lines to fuse the lining and material together at said lines and thereby form a pointed end to the lining and material.

3,935,055

ASSEMBLY TOOL FOR USE IN ATTACHING FIBERGLASS TOOL HANDLES

Joseph Allen Carmien, Beverly Hills, Calif., assignor to Nupla Corporation, Sun Valley, Calif.

Filed Aug. 30, 1974, Ser. No. 502,088
Int. Cl.² B31F *1/00*
U.S. Cl. 156—443 **3 Claims**



1. An assembly tool for use in connecting fiberglass handles to tool heads, said assembly tool comprising means for holding a tool head with a piece of masking tape extending across the top of said tool head in overlying relationship to the handle receiving opening of said tool head, a tape applicator movable with respect to said tool head, said applicator having a concave resilient pad formed complementarily to the convex portion of said tool head surrounding said opening, said pad being constructed and arranged so that said pad upon move-

ment thereof toward said tool head engages all of the peripheral edges of said tape adjacent to and surrounding said opening and moves said edges downwardly simultaneously while applying no pressure against the portion of said tape which extends across the top of said opening, whereby said tape is drawn tightly across the top of said opening, said pad being adapted upon further movement toward said tool head to press the portions of said tape disposed outwardly from said opening inwardly simultaneously into sealing engagement with said tool head around the entire periphery of said opening while said tape is held tightly drawn across said opening to seal said opening against leakage of potting compound inserted into said opening to bond a handle to said tool head.

3,935,056

APPARATUS FOR SPLICING PARALLELOGRAMMATIC PIECES OF RUBBER CLOTH WITHOUT OVERLAP

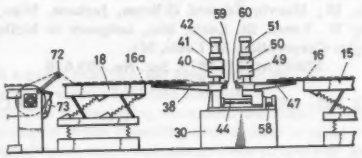
Masao Koyama, Hatano; Noboru Okada, Fujisawa, and Masahiro Ogawa, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,418

Claims priority, application Japan, Sept. 13, 1973, 48-104328

Int. Cl.² G03D 15/04

U.S. Cl. 156—507 **8 Claims**



1. In apparatus for successively splicing parallelogrammatic pieces of rubber cloth without overlap, the combination of:

a. a forward vibrating conveyor for successively feeding the pieces of rubber cloth forwardly by vibration, said forward vibrating conveyor including means for reorienting and guiding lateral edges of the successive pieces of rubber cloth traveling thereon;

b. a butt-splicer for joining the successive pieces of rubber cloth end to end without overlap, said butt-splicer including:

1. a rear table mounted forwardly of said forward vibrating conveyor for receiving the successive pieces of rubber cloth therefrom, said rear table having an edge remote from said forward vibrating conveyor;

2. a rear retractable stop;

3. means for moving said rear retractable stop between an operative position for arresting the forward movement of each piece of rubber cloth in a prescribed position on said rear table and an inoperative position away from the plane of said rear table, the piece of rubber cloth having its leading edge projecting a prescribed distance beyond said edge of said rear table when stopped in said prescribed position thereon;

4. a rear clamping platen;

5. means for moving said rear clamping platen between an operative position for clamping the piece of rubber cloth against said rear table in said prescribed position and an inoperative position for releasing the same;

6. a front table mounted forwardly of said rear table in coplanar relationship thereto, said front table having an edge opposed to said edge of said rear table;

7. a front retractable stop;

8. means for moving said front retractable stop between an operative position for arresting in a prescribed position on said front table the movement of the precedingly spliced piece of rubber cloth as the same is fed backwardly and an inoperative position away from the plane of said front table, the precedingly spliced piece of rubber cloth having its trailing edge projecting a prescribed distance beyond said edge of said front table when stopped in said prescribed position thereon;

9. a front clamping platen;

10. means for moving said front clamping platen between an operative position for clamping the precedingly spliced piece of rubber cloth against said front table in said prescribed position thereon and an inoperative position for releasing the same; and

11. means for moving at least one of said front and rear tables toward and away from the other whereby said opposed edges of said front and rear tables can be forced into abutting contact with each other for splicing operation;

c. a backward vibrating conveyor mounted forwardly of said butt-splicer for selectively feeding the precedingly spliced piece of rubber cloth backwardly to said butt-splicer by vibration, said backward vibrating conveyor including means for reorienting the piece of rubber cloth traveling backwardly thereon; and

d. take-up means for carrying the spliced pieces of rubber cloth away from said butt-splicer via said backward vibrating conveyor by indexed movement.

3,935,057

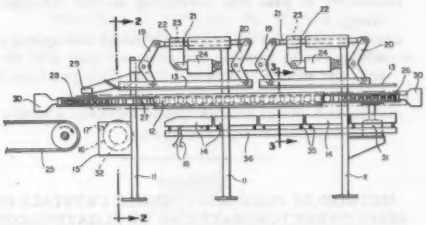
APPARATUS FOR SECURING THE FREE END OF A ROLL OF FIBROUS WEB MATERIAL

Robert D. Gray, Wilmington, Del., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 28, 1974, Ser. No. 501,146

Int. Cl.² B65C 11/04; B05C 11/00

U.S. Cl. 156—578 **7 Claims**



1. Apparatus for securing the free end of a roll of fibrous web material, comprising:

moisture-application means for applying moisture to a selected location on the outside surface of the free end while the free end is against the roll, the moisture-application means comprising a knurled-periphery wheel mounted for rotation in the direction of movement of the roll through the apparatus and in a position where its periphery contacts the periphery of the roll when the roll is moved past, a reservoir into which the wheel extends for picking up moisture held in the reservoir, means for rotating the wheel slightly faster than movement of the roll past the wheel, and doctor means positioned adjacent the wheel for wiping excess moisture from the wheel;

heat-application means for applying heat to the moistened selected location;

pressure-application means for applying pressure to the moistened selected location simultaneously with applying heat;

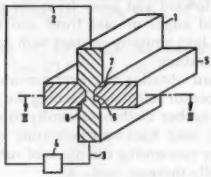
guide means for guiding the roll in its axial direction past and into operative contact with the moisture-application means, the heat-application means and the pressure-application means; and

roll-conveyance means for moving the roll uninterruptedly past the moisture-application means, the heat-application means, and the pressure-application means.

3,935,058
ZONE MELTING PROCESS

Wilhelm H. Kuhlmann-Schäfer, Hannover, Germany, assignor to Preussag Aktiengesellschaft, Germany

Continuation of Ser. No. 270,692, July 11, 1972, abandoned.
This application June 21, 1974, Ser. No. 481,819
Claims priority, application Germany, July 15, 1971, 2135305
Int. Cl.² B01J 17/08
U.S. Cl. 156—602 12 Claims



1. A zone melting process for purifying a charge utilizing a narrower having an aperture therethrough, said aperture defining an inlet, a central region, and an outlet, the cross-sectional area of said central region being less than the cross-sectional area of said charge adjacent to said narrower, comprising the steps of:

passing an alternating current longitudinally through said charge to heat said charge by Joule heating;

driving said charge into direct physical contact with said narrower, through said inlet and into said central portion to reduce the cross-sectional area of a portion of said charge and define a zone of molten liquid in said charge, said zone being within and closely adjacent said aperture;

continuing to pass said alternating current through said charge;

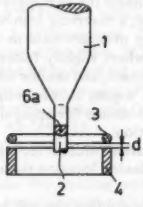
causing said molten liquid to flow through said aperture and said outlet to increase the cross-sectional area of said zone and solidify said molten liquid exiting said aperture; and

moving said charge relative to said narrower whereby said zone migrates through said charge.

3,935,059
METHOD OF PRODUCING SINGLE CRYSTALS OF SEMICONDUCTOR MATERIAL BY FLOATING-ZONE MELTING

Michel Ayel, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 56,631, July 20, 1970, abandoned.
This application June 28, 1972, Ser. No. 267,178
Int. Cl.² B01J 17/10
U.S. Cl. 156—620 2 Claims



1. In a floating melt zone process for forming a monocrystalline semiconductor rod from a seed crystal in contact with an end of a rod of semiconductor material, wherein the diameter of the rod varies at least over a portion of the length thereof, a method for generating a floating melt zone of substantially constant axial depth moving axially through the rod of varying diameter at a substantially constant axial displacement rate, said method comprising the steps of:

positioning axially with respect to the rod a high frequency inductance coil radiating sufficient energy to generate a floating melt zone of at least the desired axial depth even when positioned over the rod region of maximum diameter;

positioning a short circuit ring axially with respect to the rod;

slowly moving the radiating inductance coil axially with respect to the rod at a substantially constant rate from the end in contact with the seed crystal to the other end; and

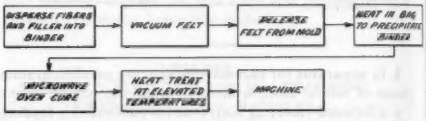
maintaining the short circuit ring in axial position with respect to the rod at an axial distance from the inductance coil which varies directly with the diameter of the rod at the floating melt zone,

whereby the short circuit ring absorbs radiated energy in excess of the amount required to maintain a substantially constant axial depth for the floating melt zone as the floating melt zone travels through the rod at a substantially constant axial displacement rate.

3,935,060
FIBROUS INSULATION AND PROCESS FOR MAKING THE SAME

James C. Blome, Bridgeton, Mo.; Chris J. Goodbrake, Vandalia, Ill.; Marvin Edward O'Brien, Jackson, Miss., and Macy W. Vance, St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 25, 1973, Ser. No. 409,620
Int. Cl.² D21H 5/18
U.S. Cl. 162—152 8 Claims



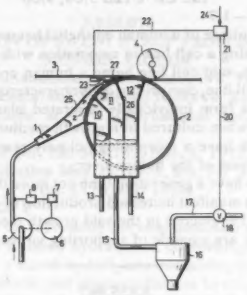
1. A process for making a fibrous insulation, said process comprising forming a slurry containing by weight about 2.1% to about 7.5% ceramic fibers, about 18% to about 22% colloidal silica binder which is capable of forming a ceramic when fired, not more than about 5.4% ceramic filler, and about 60% to about 80% water; felting the slurry to form a soft felt in which the fibers cross at junction points; precipitating the binder onto the fibers and filler by mixing into the slurry hexamethylenetetramine which generates ammonia at between about 160°F. and 205°F. and heating the soft felt to between about 160°F. and 205°F. for about 60 to about 120 minutes to generate the ammonia so as to elevate the pH of the liquid within the felt to at least about 6.5 and thereby cause the binder to concentrate and gel at the junction points, said heating to between 160°F. and 205°F. being in an enclosure to prevent excessive evaporation of liquid from the soft felt; thereafter subjecting the soft felt to microwave energy to dry the felt; and firing the felt to increase its strength.

6. An insulative material comprising: ceramic fibers disposed in a random network such that some of the fibers cross over other fibers, creating interstices in the network; a granular ceramic filler with the granules thereof being in the interstices of the network, whereby the crossing fibers and the fillers form junction points in the network; and a binder concentrated at the junction points of the fibrous network and holding the fibers and the granules of the filler in place, the binder being silica; the insulative material having a density between approximately 10 lbs./ft.³ and 38 lbs./ft.³ with the fibers constituting between approximately 20% and 80% of the weight of the material, the binder between approximately 10% and 40%, and the granular filler not more than approximately 50%.

3,935,061
STOCK INLET FOR A PAPER MACHINE

Peter Biornstad, Ravensburg, Germany, assignor to Escher Wyss GmbH, Ravensburg, Germany

Filed Dec. 4, 1973, Ser. No. 421,606
Claims priority, application Switzerland, Dec. 11, 1972, 17969/72
Int. Cl.² D21F 1/02, 1/04, 1/06
U.S. Cl. 162—252 8 Claims



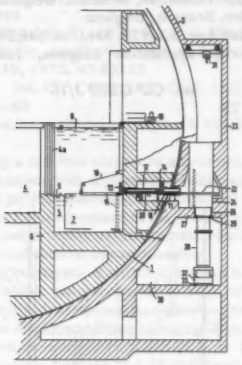
1. In a paper machine, the combination of
a movable water-permeable element;
a feed duct for supplying stock onto said element, said duct having an outlet extending over a sheet-forming zone of said element and terminating at one end of said zone;
means for feeding stock to said feed duct at a constant quantity per unit of time;
at least one suction box disposed in the region of said zone on a side opposite said feed duct;
a vacuum source connected to said suction box to evacuate said box;
a control means for controlling the vacuum in said suction box; and
a sensor in said feed duct for measuring the stock pressure in said zone, said sensor being connected to said control means to deliver a signal thereto indicative of the stock pressure, wherein said control means controls the vacuum in said vacuum box in response to deviations of said signal from a set value to maintain a constant column of stock at said outlet of said feed duct.

3,935,062
NUCLEAR POWER PLANT WITH A SAFETY ENCLOSURE

Wolfgang Keller, Erlangen; Joachim Krüger, Forchheim; Johann Ropers, Erlangen, Dechsendorf, and Hans-Peter Schabert, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 24, 1973, Ser. No. 353,998
Claims priority, application Germany, Apr. 26, 1972, 2220491
Int. Cl.² G21C 19/20
U.S. Cl. 176—30 10 Claims

1. A nuclear power plant comprising a pressure containment shell having a personnel lock extending therethrough, means inside of said shell forming a water-floodable reactor fuel-element changing space and a water-floodable fuel-element storage basin connecting with said space, a fuel-element storage rack in said basin, a fuel-element transport vessel on the outside of said shell; a fuel-element lock extending through said shell and transversely dimensioned for the endwise passage of fuel elements therethrough, said fuel-element lock having an inner end in said basin and an outer end on the outside of said shell, means in said basin for transferring fuel-elements between said inner end and said rack, and means on

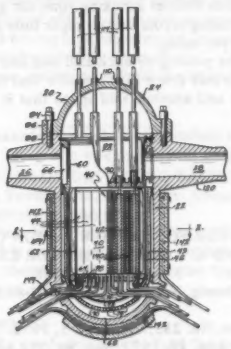


the outside of said shell for transferring fuel-elements under water between said outer end and said vessel.

3,935,063
EMERGENCY HEAT REMOVAL SYSTEM FOR A NUCLEAR REACTOR

Thomas L. Dunckel, Potomac, Md., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 28, 1973, Ser. No. 419,832
Int. Cl.² G21C 9/00; F28D 15/00
U.S. Cl. 176—38 5 Claims



1. An apparatus for removing decay heat from a nuclear reactor having a core, pressure vessel, and cooling system comprising: a heat exchange reservoir; a plurality of heat pipes having a working fluid selected from the group consisting of water, sodium, lithium, bismuth and mercury, the first end of a heat pipe in heat transfer relationship with the nuclear reactor and the second end within the reservoir; a fluid storage tank with fluid therein; a fluid connecting means between the reservoir and tank having a valve; a means to detect core temperatures; and a means to activate the connecting means valve upon detecting core temperatures to control the fluid flow between the storage tank and heat exchange reservoir.

3,935,064

FUEL ASSEMBLY FOR GAS-COOLED NUCLEAR REACTORS

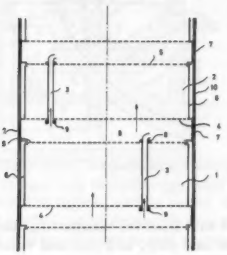
John Mackinlay Yellowlees, Brussels, Belgium, assignor to Belgonucleaire, Brussels, Belgium

Filed Apr. 5, 1973, Ser. No. 348,298

Claims priority, application Belgium, June 19, 1972, 118875

Int. Cl.² G21C 3/16

U.S. Cl. 176—73 9 Claims



1. A fuel assembly for gas-cooled nuclear reactors, comprising:

a wrapper tube;

inside said wrapper tube is positioned a number of beds each said bed being defined above it and below it by spaced apart plates which permit gas coolant to pass therethrough; each said bed containing fuel comprised of coated particles; said beds are superposed in a stacked array and so as to form between neighboring said beds a space which defines a mixing zone for gas coolant; said beds extending across said wrapper tube and each sealing said wrapper tube;

a bypass tube passing by each said bed and communicating between a said space that is above that said bed which it passes by and another said space that is below that said bed;

whereby gas coolant flow is divided between a said bed and a said bypass tube.

3,935,065

PROCEDURE FOR CONSERVATION OF LIVING ORGANS AND APPARATUS FOR THE EXECUTION OF THIS PROCEDURE

Roland Karl Doerig, Nordstrasse 350, CH-8037, Zurich, Switzerland

Division of Ser. No. 285,739, Sept. 1, 1972. This application Aug. 29, 1973, Ser. No. 392,441

Claims priority, application Switzerland, Sept. 2, 1971, 13000/71; Mar. 24, 1972, 4479/72

Int. Cl.² C12B 3/00, 9/00

U.S. Cl. 195—1.7 2 Claims

1. In a process for the conservation, storage and transport of a living organ using a portable apparatus having an organ compartment, a pump compartment and a cooled liquid perfusion medium enriched with a respiratory gas, wherein said perfusion medium is subjected to automatic regulation of the flow rate of said gas in response to the flow resistance in the organ, the improvement comprising the use of dry ice and the CO_2 gas resulting therefrom for the cooling of the perfusate and the operation both of the perfusing pump and of the pumping means for oxygenating the perfusate with air.

3,935,066

CELL LINES

Kostadin Apostolov, London, England, assignor to Burroughs Wellcome Co., Tuckahoe, N.Y.

Continuation of Ser. No. 301,429, Oct. 27, 1972, abandoned, which is a continuation of Ser. No. 108,228, Jan. 20, 1971, abandoned, which is a continuation of Ser. No. 50,289, June 26, 1970, abandoned. This application Dec. 13, 1974, Ser. No. 532,609

Claims priority, application United Kingdom, July 3, 1969, 33605/69

Int. Cl.² C12B 3/00, 9/00

U.S. Cl. 195—1.7 4 Claims

1. A cell culture of a human epithelial heteroploid liver cell line, comprising a cell line in association with a nutrient culture medium, said cell line being a human epithelial heteroploid liver cell line, comprising cells characterized as follows:

a. the cells form individually separated islands or discrete clumps when cultured in a growth medium;

b. the cells have a morphology closely resembling that of hepatocytes of the human liver;

c. the cells have a generation time not more than 24 hours;

d. the cells manifest increased production of glycogen in the presence of 1% glucose in the said growth medium; and

e. the cells are capable of supporting viruses.

3,935,067

INORGANIC SUPPORT FOR CULTURE MEDIA

Richard L. Thayer, Billings, Mont., assignor to Wyo-Ben Products, Inc., Billings, Mont.

Filed Nov. 22, 1974, Ser. No. 526,376

Int. Cl.² C12B 3/00; C12K 1/10; C12B 1/00

U.S. Cl. 195—1.7 22 Claims

1. In an aqueous microbial or tissue-cell culture medium which consists essentially of a support, nutrient matter and water, the improvement wherein the support is water-swellable to an extent of at least 3-fold in contact with sufficient water, and the support and water together constitute a solid or semi-solid non-particulate mass which is inorganic, is water-retentive, is thixotropic, and is a non-nutritive microbial or tissue-cell growth support.

3,935,068

CONTINUOUS ISOMERIZATION PROCESS UTILIZING IMMOBILIZED FLOCCULATE ENZYME

Charles W. Nystrom, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jan. 2, 1973, Ser. No. 320,035

Int. Cl.² C12D 13/00

U.S. Cl. 195—31 F 5 Claims

1. A continuous process for converting glucose to fructose which comprises passing a glucose-containing solution through a bed of immobilized glucose isomerase wherein the immobilized glucose isomerase is used in the form of an aggregate comprising cell-free glucose isomerase and a water-soluble polyelectrolyte flocculating agent selected from the group consisting of cationic polyelectrolytes and anionic polyelectrolytes.

3,935,069

ENZYMATIC PROCESS USING IMMOBILIZED MICROBIAL CELLS

Margaret Esther Long, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Dec. 23, 1974, Ser. No. 535,615

Int. Cl.² C12B 1/00

U.S. Cl. 195—31 F 20 Claims

1. A process for effecting an enzyme-catalyzed transformation of a substrate which comprises contacting the substrate, under conditions suitable for effecting said enzyme catalyzed transformation, with an aggregate comprising microbial cells having associated therewith active quantities of said enzyme,

a polyelectrolyte flocculating agent and amounts of an oxide, hydroxide, phosphate or sulfate of a metal selected from the group consisting of magnesium, calcium, iron and manganese sufficient to produce increased hardness in the aggregate and recovering the transformed substrate, said aggregate having been dried prior to use in said transformation.

3,935,070

PRODUCTION OF SWEET SYRUP FROM DEXTROSE MOTHER LIQUOR

Mikio Suekane, Saitamaken; Shiro Hasegawa, Tokyo; Masaki Tamura, Machida, and Yoshiyuki Ishikawa, Kunitachi, all of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 303,751, Nov. 6, 1972, abandoned. This application May 22, 1975, Ser. No. 579,992

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—31 F **17 Claims**

1. A process for increasing the sweetness and monosaccharide content of a starch hydrolysate, comprising:

a. subjecting a starch hydrolysate containing dextrose, maltose, isomaltose and oligosaccharides to enzymatic isomerization to isomerize at least a portion of the dextrose in said starch hydrolysate to levulose, and then

b. treating said hydrolysate with an enzyme preparation having isomaltase or transglucosidase activity to produce a syrup which is sweeter and contains a higher amount of monosaccharides than said starch hydrolysate.

16. A continuouse process for increasing the sweetness and monosaccharide content of a hydrol liquor, comprising:

a. acid or enzyme thinning a starch slurry to a D.E. of 10 or less, followed by enzymatic saccharification of the thinned starch to obtain a hydrolysate having a D.E. above about 95,

b. crystallizing the dextrose from said hydrolysate to obtain a crystalline dextrose and a hydrol,

c. continuously passing said hydrol through a column packed with a xylose isomerase enzyme preparation to partially isomerize the dextrose in said hydrol and thereafter

d. continuously passing said hydrol containing partially isomerized dextrose through a column containing an enzyme preparation having isomaltase or transglucosidase activity, said enzyme preparation having been absorbed on bentonite.

3,935,071

PROCESS FOR THE CONVERSION OF GLUCOSE INTO GLUCONIC ACID

Hans Ulrich Bergmeyer, and Dieter Jaworek, both of Tutzing, Obb, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim Waldhof, Germany

Filed Mar. 13, 1973, Ser. No. 340,775

Claims priority, application Germany, Mar. 24, 1972, 2214442

Int. Cl.[2] C12D *1/02*; **C12D** *1/06*

U.S. Cl. 195—32 **15 Claims**

1. Process for the conversion of glucose into gluconic acid by enzymatic oxidation in the presence of oxygen in aqueous solution, which process comprises passing a glucose-containing aqueous solution over a catalyst comprising an insoluble gel carrier to which is bound a mixture of glucose oxidase and catalase in close side by side proximity.

3,935,072

PURIFICATION OF COENZYME A

Ichiro Chibata, Saita; Tetsuya Tosa, Kyoto, and Yuhei Matuo, Saita, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed July 31, 1973, Ser. No. 384,212

Claims priority, application Japan, Aug. 10, 1972, 47-80113; Aug. 10, 1972, 47-80115

Int. Cl.[2] C07G *7/02*, *7/00*, *3/00*

U.S. Cl. 195—68 **12 Claims**

1. A process for purifying coenzyme A which comprises the steps of:

A. admixing a cell-free extract of a coenzyme A-producing microorganism with a cyanogen halide-activated water-insoluble polysaccharide at a pH of 6 to 9 thereby immobilizing proteins contained in the extract; and washing the immobilized proteins until materials which are not covalently bound thereto are removed; or

B. admixing coenzyme A with a cyanogen halide-activated water-insoluble polysaccharide at a pH of 6 to 8 to give an immobilized coenzyme A; contacting the immobilized coenzyme A with a cell-free extract of a coenzyme A-producing microorganism at a pH of 6 to 8, said extract having an ionic strength of 0.05 to 0.1, whereby proteins which exhibit special and unique affinity to coenzyme A and are inherently contained in living cells of the coenzyme A-producing microorganism are adsorbed on the immobilized coenzyme A; washing the immobilized coenzyme A with an aqueous solution of pH 6 to 8 having an ionic strength of 0.05 to 0.1; contacting the washed immobilized coenzyme A with an aqueous solution of pH 6 to 8 having an ionic strength higher than 0.5 to elute the proteins from the immobilized coenzyme A; and admixing the resultant proteins with a cyanogen halide-activated water-insoluble polysaccharide at a pH of 6 to 9 to give immobilized proteins; and

C. contacting a coenzyme A solution with the immobilized proteins or enzymes at a pH of 6 to 8 to have coenzyme A adsorbed on the immobilized preparation; washing the immobilized proteins with an aqueous solution of pH 6 to 8 having an ionic strength lower than 0.4; and then contacting the washed immobilized proteins with an aqueous acidic solution of pH 2 to 5 or with an aqueous solution of pH 6 to 8 having an ionic strength aqueous solution of pH 6 to 8 having an ionic strength of 0.1 to 0.5, at 0° to 30°C, to elute coenzyme A from the immobilized preparation.

3,935,073

METHOD FOR DETECTING BACTERIA

John R. Waters, Towson, Md., assignor to Johnston Laboratories, Inc., Cockeysville, Md.

Division of Ser. No. 30,675, April 22, 1970, Pat. No. 3,676,679, which is a continuation-in-part of Ser. No. 770,484, Oct. 25, 1968, abandoned. This application Sept. 22, 1971, Ser. No. 182,812

Int. Cl. C12k *1/00*

U.S. Cl. 195—103.5 R **9 Claims**

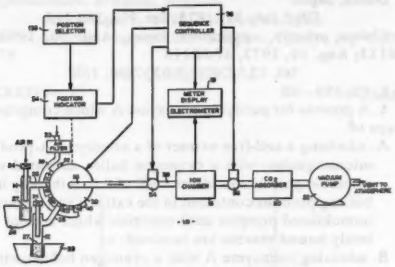
1. A method for analyzing a body fluid for the presence of bacteria therein, said method comprising:

placing a sample of the body fluid into a closed container together with a growth medium containing water including a C^{14} carbon containing carbon source which is fermentable to produce carbon dioxide;

exposing the medium with the sample therein in said closed container to conditions conducive to the occurrence of normal metabolic processes for a period of time sufficient to cause production of $C^{14}O_2$ by the fermentation of said source;

thereafter removing at least a portion of the gaseous atmosphere from within the container above the medium and the sample and replacing a portion of the atmosphere in said container; and

determining the presence of $C^{14}O_2$ in said gaseous atmosphere by measuring the radioactivity of said removed portion of said gaseous atmosphere in radioactivity mea-



suring means while the gaseous atmosphere remains in a gaseous condition; and flushing said radioactivity measuring means with gas to remove the radioactive gaseous atmosphere therefrom.

3,935,074

ANTIBODY STERIC HINDRANCE IMMUNOASSAY WITH TWO ANTIBODIES

Kenneth Edward Rubenstein, Palo Alto, and Richard K. Leute, Sunnyvale, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Dec. 17, 1973, Ser. No. 425,376
Int. Cl. G01n *31/00*; C12k *1/04*
U.S. Cl. 195—103.5 R **24 Claims**

1. A method for determining the presence of a ligand in an unknown suspected of containing said ligand which comprises:

combining in an aqueous medium said unknown, antiligand, anti(detector ligand) and Reagent, wherein said Reagent has a pair of epitopes in close proximity so that simultaneous binding of receptors to said pair of epitopes is sterically inhibited, wherein one of said pair of epitopes is recognized by said antiligand and the other of said pair of epitopes is recognized by said anti(detector ligand);

determining by a detectant the amount of remaining unbound anti(detector ligand) or anti(detector ligand) bound to Reagent; and

determining the presence of ligand by comparing said amount determined with said amount determined with a medium having a known amount of ligand.

3,935,075

AUTOMATIC BACTERIAL SPECIMEN STREAKER AND METHOD FOR USING SAME

Russell C. Perry, Smithtown, and Roy W. Porter, Roslyn Heights, both of N.Y., assignors to Diagnostic Research, Inc., Roslyn, N.Y.

Filed May 13, 1974, Ser. No. 469,457
Int. Cl.² C12B *1/02*
U.S. Cl. 195—127 **15 Claims**

1. Automatic bacterial specimen streaking apparatus comprising:

a. a table;

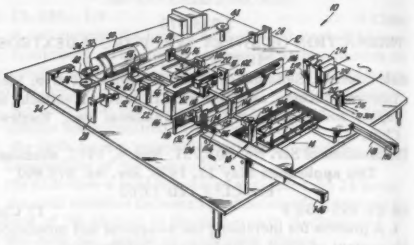
b. means for mounting a tray containing the specimen on said table whereby the tray is non-moveably held with respect to said table when said apparatus is in use;

c. moveable loop means positioned above said mounting means in the vicinity of the area to be occupied by the tray, said loop means being arranged to selectively contact the specimen in the tray;

d. first displacing means for moving said loop means from a starting position in a first direction over the area of said mounting means to be occupied by the tray;

e. second displacing means for moving said loop means from a starting position in a second direction over the area of said mounting means to be occupied by the tray, said second displacing means moving said loop means concurrently with the movement thereof in said first direction, said second direction being substantially perpendicular to said first direction to thereby define a figure eight movement pattern of said loop means;

f. a drive system for synchronously moving said first and said second displacing means;



g. means for advancing said loop means from the starting position thereof and in a direction parallel to said first direction of movement after the completion of each figure eight pattern to thereby define a plurality of successive figure eight patterns having a plurality of cross-over points between adjacent figure eight patterns; and

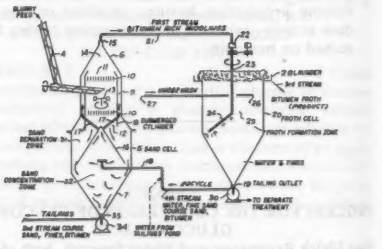
h. means for returning said loop means to the starting position thereof after a predetermined length of travel in said first direction.

3,935,076

TWO STAGE SEPARATION SYSTEM

Lubomyr M. O. Cymbalisty, Edmonton, Canada, assignor to Canada-Cities Service, Ltd.; Atlantic Richfield Canada Ltd. and Gulf Oil Canada Ltd., all of, Canada

Division of Ser. No. 364,343, May 29, 1973, Pat. No. 3,487,789. This application Aug. 23, 1974, Ser. No. 500,092
Int. Cl.² B01D *11/00*; C10G *1/00*
U.S. Cl. 196—14.52 **4 Claims**



1. A two-cell separator, for use in the hot water process for extracting bitumen from a slurry containing bitumen, coarse and fine sand particles, and water, comprising:

a. a sand cell vessel having a side wall and conical bottom and adapted to contain a body of hot water,

b. means associated with the sand cell vessel intermediate its upper and lower ends for introducing the slurry thereinto,

c. means associated with the sand cell vessel at its upper end for removing therefrom a first stream,

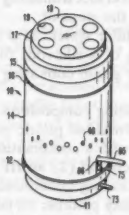
d. means extending into the sand cell vessel's lower end for discharging a recycle stream thereinto,

e. means associated with the sand cell vessel at its lower end for removing therefrom a second stream;
f. a froth cell vessel having a side wall and adapted to contain a body of hot water,
g. means, associated with the froth cell vessel intermediate its upper and lower ends, for distributing the first stream thereinto uniformly across its cross-sectional area,
h. means associated with the froth cell vessel at its upper end for removing therefrom a third stream,
i. means associated with the froth cell vessel at its lower end for removing a fourth stream,
j. means connecting the means (c) with the means (g) for transferring the first stream therebetween; and
k. means connecting the means (i) with the means (d) for recycling the fourth stream therebetween.

3,935,077
AUTOMATIC WATER DISTILLER

Clifford C. Dennison, 440 Centenary Ave., Cleveland, Tenn. 37311

Filed Apr. 29, 1974, Ser. No. 464,831
Int. Cl.² B01D 3/00; C02B 1/08
U.S. Cl. 202—83 6 Claims

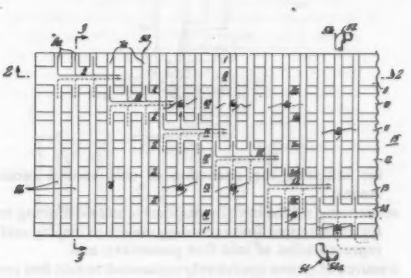


1. A water distillation apparatus including:
a base;
a shell removably supported by said base;
insulated evaporator means disposed within said shell and said base;
a condensing chamber disposed within said shell above said insulated evaporator means;
insulated means to transport steam from said insulated evaporator means to said condensing chamber;
a water cooling and preheating chamber disposed above said condensing chamber, said water cooling and preheating chamber having a common wall with said condensing chamber to provide heat exchange therebetween;
first means to supply water to said water cooling and preheating chamber to aid in cooling the steam in said condensing chamber;
second means to supply the water in said water cooling and preheating chamber to said insulated evaporator means when the water in said water cooling and preheating chamber reaches a predetermined level;
said condensing chamber having its outer wall spaced from said shell to form a passage therebetween;
means to cause the flow of air through said passage to aid in cooling the steam in said condensing chamber;
means to inactivate said first water supply means, said insulated evaporator means, and said causing means when the water in said storage chamber reaches a predetermined level;
a storage chamber disposed within said shell above said insulated evaporator means and beneath said condensing chamber, for storing the distilled water from said condensing chamber produced by condensation of the steam in said condensing chamber;
said insulated means to transport steam extending through said storage chamber and being insulated therefrom;
an annular plate mounted at its inner circumference on said insulated means to transport steam, separating said condensing chamber from said storage chamber, with its outer circumference spaced from said outer wall of said condensing chamber, for directing a portion of the steam from said condensing chamber into said storage chamber.

3,935,078
WASTE HEAT EXHAUST SYSTEM FOR SIDE BURNER REGENERATIVE COKE OVEN BATTERIES HAVING A DIVIDED HEATING SYSTEM

Friedrich Thiersch; Manfred Strobel, and Theo Schmitz, all of Recklinghausen, Germany, assignors to Firma Carl Still, Germany

Filed Dec. 20, 1974, Ser. No. 534,888
Claims priority, application Germany, Dec. 22, 1973, 2364330
Int. Cl.² C10B 5/12
U.S. Cl. 202—141 4 Claims



1. A waste heat exhaust system for side burner regenerative coke oven batteries having a divided heating system, comprising a coke oven battery having a pusher side and a coke side, a chimney flue connected to one end of said battery, said battery having a plurality of flue gas ducts extending in a longitudinal direction and connected at their one ends to said chimney flue, a plurality of transverse first flues of unequal length having outer ends connected to respective waste gas lines on the pusher side of said battery and extending transversely to said flue gas ducts and having inner ends connected to respective ones of said gas ducts at spaced longitudinal locations along the length thereof, and a plurality of transverse second flues of unequal lengths having outer ends connected to respective waste gas lines on the coke side of said battery and extending transversely to said flue gas ducts and having inner ends connected to respective ones of said gas ducts at spaced locations along the length of said batteries.

3,935,079
METHOD AND APPARATUS FOR DISPLAYING ACTIVE OXYGEN AND SENSOR TEMPERATURE

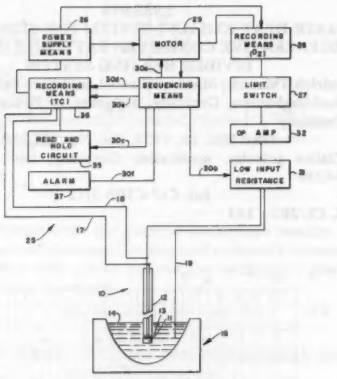
Charles E. Fitterer, Allison Park, and Carl D. Cassler, Pittsburgh, both of Pa., assignors to Fitterer Engineering Associates, Inc., Oakmont, Pa.

Filed Nov. 3, 1972, Ser. No. 303,370
Int. Cl.² G01N 27/46; G08B 29/00
U.S. Cl. 346—45 19 Claims

1. An apparatus for displaying at least a pair of physical representations which respectively represent at least a first and a second sensed parameter, comprising the combination of:
input circuit means for receiving a first signal and a second signal which are respectively electrical representations of said first parameter and said second parameter;
first recording means operatively connected to said input circuit means for receiving said first signal representative

of said first parameter and for displaying a first physical representation of said signal upon command;

second recording means for receiving said second signal representative of said second parameter and for displaying a second physical representation of said second signal, said second recording means including limiting means responsive to a predetermined level of said second signal



for initiating the operation of said second recording means;

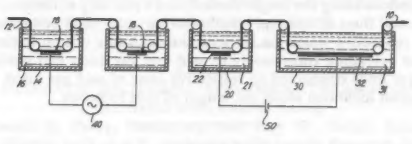
sequencing means initially responsive to said limiting means for causing said first recording means to display said first representation of said first parameter; and

a source of power operatively connected to said first recording means and said second recording means.

3,935,080
METHOD OF PRODUCING AN ALUMINUM BASE SHEET FOR A PRINTING PLATE

Robert Gumbinner, Tarrytown, and Ken-ichi Shimazu, Pleasantville, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,344
Int. Cl.² C25D *5/00*, *5/44*; B23P *1/00*
U.S. Cl. 204—28 5 Claims



1. A method of producing an aluminum base sheet suitable for a printing plate, which comprises:

a. First graining the surface of said aluminum base sheet by treatment for from one-half to two minutes in an aqueous electrolytic solution containing from 0.1 to 20 per cent of an electrolyte selected from the group consisting of HCl, NaCl, LiCl and KCl, with an alternating voltage providing a current density of from about 0.1 to 10 amps per square inch, at a temperature of from 20° to 95°C., to increase the surface area of said aluminum sheet by about 500%; and

b. Then cleaning the said grained aluminum sheet by treatment thereof for from ⅛ to 2 minutes in an aqueous solution of sulfuric acid of concentration of from about 10 to 50 weight percent, with a direct voltage providing a current density of from about 0.1 to about 10 amps per square inch, at a temperature of from about 20° to 80°C, wherein said aluminum sheet is the cathodic electrode; and

c. Then anodizing the said cleaned aluminum sheet by treatment thereof in an aqueous solution of sulfuric acid having a concentration of from 8 to 22 weight percent for from ⅛ to 3 minutes, with a direct voltage providing a current density of from 1 to 100 amperes per square foot at a temperature of from 20° to 80°C wherein said aluminum sheet is the anodic electrode, to yield a grained, cleaned and anodized aluminum base sheet suitable for a printing plate.

3,935,081
DENSITY CONTROL FOR ELECTROPLATABLE POLYMER COMPOSITIONS

James A. Shotton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1973, Ser. No. 388,158
Int. Cl.² C25D *5/56*, *3/38*, *5/10*
U.S. Cl. 204—30 8 Claims

1. A process for barrel electroplating a normally solid polymer which comprises the steps of:

a. incorporating a filler system into said plastic, said filler system consisting of a siliceous filler and a heavy filler selected from the group consisting of barium sulfate and zinc oxide;

b. molding the resulting composition of plastic and fillers;

c. conditioning the molded plastic product of step (b) by contacting same with a combination, in series, of (1) an acid chromate etch and (2) an HF treatment;

d. preplating the resulting conditioned product of step (c) with an electrolessly platable metal; and

e. electroplating the preplated product of step (d) with a final finish to obtain a metal-plated plastic product; wherein said siliceous filler is present in an amount ranging from 10 to 40 weight percent, said heavy filler is present in an amount ranging from 5 to 35 weight percent, and the filler system of said siliceous and said heavy filler is present in an amount ranging from 15 to 60 weight percent, and the weight ratio of said siliceous filler to said heavy filler is in the range of about 0.2:1 to about 5:1, and wherein the composition resulting from step (a) has a density not less than the density of the plating baths of steps (d) and (e).

3,935,082
PROCESS FOR MAKING LEAD ELECTRODE

Heinz Peter Fritz, Garching, and Detlef Missol, Hart, both of Germany, assignors to Rheinisch-Westfalisches Elektrizitatswerk AG, Essen, Germany

Continuation-in-part of Ser. No. 440,449, Feb. 7, 1974, abandoned. This application May 10, 1974, Ser. No. 468,804
Claims priority, application Germany, Feb. 13, 1973, 2306957
Int. Cl.² C25D *5/42*, *9/06*
U.S. Cl. 204—32 R 10 Claims

1. A process for making an electrode containing lead oxide as an active material, comprising the steps of:

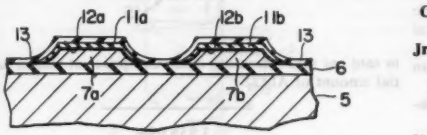
a. immersing a body of titanium in a hot solution of oxalic acid having a titanium-oxalato complex dissolved therein; and

b. anodically coating the so treated body with PbO_2 in an electrolyte containing the ions of lead (II) and the ions of a lead (II) salt of an organic sulfate or phosphate with a highly polar group.

3,935,083
METHOD OF FORMING INSULATING FILM ON INTERCONNECTION LAYER

Akihiro Tomozawa, Kodaira; Kensuke Nakata, Tokorozawa; Akira Kikuchi, and Takashi Agastuma, both of Kodaira, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 7, 1974, Ser. No. 431,488
Claims priority, application Japan, Jan. 12, 1973, 48-5973
Int. Cl.² C25D 5/02; B01J 17/00; H01L 23/28
U.S. Cl. 204—38 A 4 Claims



1. A method of forming a protected interconnection layer overlying the surface of a substrate structure comprising the steps of:

a. forming a first metallic layer over the surface of said substrate structure;

b. anodically oxidizing a thin portion of the upper surface of said first metallic layer to form a first porous metallic-oxide insulating film on said first metallic layer;

c. selectively removing prescribed portions of said porous film and said first metallic layer to expose the surface of said substrate structure and to form gradually sloping side surfaces of said first metallic layer;

d. forming a second metallic layer on the entire surface of the substrate structure and layer resulting from said (c);

e. anodically oxidizing said second metallic layer to form a second porous metallic oxide film therefrom;

f. anodically converting the surface portion of said first metallic layer facing said second porous metallic oxide film into a non-porous metallic oxide film;

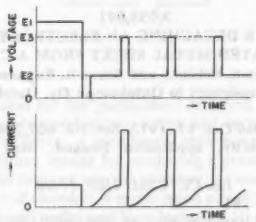
g. removing portions of said second porous metallic oxide film lying in the etched-out portions of said first metallic layer on said substrate structure; and

h. forming, by chemical vapor deposition, a further protective insulating film on the substrate resulting from step (g).

3,935,084
ANODIZING PROCESS

Shiro Terai, Nagoya; Akinari Ichiryu, Aichi; Toshio Suzuki, Kasugai, and Yoshikatsu Hayashi, Nagoya, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Mar. 28, 1974, Ser. No. 455,947
Int. Cl.³ C25D 11/14
U.S. Cl. 204—58 5 Claims

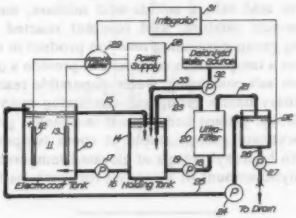


1. A process of forming a colored oxide film on a substrate of aluminium or an aluminium alloy, which comprises subjecting the substrate to anodizing at a direct-current voltage E_1 of 10 to 20 volts in an electrolyte comprising an aqueous solution of 4 to 15% by weight of sulfuric acid to form a substantially colorless oxide film on the surface of the substrate, then dropping the voltage E_1 to zero and subjecting the substrate carrying the oxide film on its surface to electrolytic treatment in the same electrolyte by applying an alternating-current voltage E_2 of 2 to 4 volts for a period of 2 to 20 minutes to develop a recovery effect and obtain an oxide film of desired color tone.

3,935,085
COMPOSITION CONTROL OF AN ELECTROCOATING BATH

Jr. Baker, Pleasanton, and Willard J. Springer, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 6, 1974, Ser. No. 448,597
Int. Cl.² C25D 13/06
U.S. Cl. 204—181 4 Claims



1. In the method of electrocoating metal products wherein the electrocoating bath contains polycarboxylic acid coating resin which has been at least partially neutralized with an agent selected from the group consisting of organic amines, ammonium hydroxide, potassium hydroxide, sodium hydroxide and lithium hydroxide and wherein electrocoating bath is passed through an ultrafilter so as to separate neutralization agent therefrom and at least part of the ultrafilter permeate containing neutralization agent is discarded, the improvement comprising

a. sensing the electrocoating current; and

b. discarding a predetermined amount of permeate containing the neutralization agent in accordance with the current sensed.

3,935,086
ELECTRODIALYSIS PROCESS

Teruyuki Misumi, and Sakae Tsushima, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1975, Ser. No. 549,738
Int. Cl.² B01K 5/00; C08F 15/02
U.S. Cl. 204—180 P 9 Claims

1. An anionic ion-exchange membrane, comprising a film of a crosslinked vinyl imidazole polymer or copolymer, said membrane having the properties of:

1. an anionic transport number which is 0.60 or more;

2. a specific electric conductivity which is 0.5×10^{-3} to 20×10^{-3} $\Omega^{-1}cm^{-1}$ (at 25°C, in 0.5N aqueous sodium chloride solution); and

3. a resistance to organic contamination which is 10 minutes or more in terms of the time needed before the electrodialysis voltage becomes twice as much as that at the start up of electrodialysis when 0.5N aqueous sodium chloride solution containing 10 ppm sodium dodecyl benzene sulfonate is subjected to electrodialysis at current density of 1.1 A/dm².

3,935,087

METHOD FOR ELECTRODEPOSITION OF SELF-CROSSLINKING CATIONIC COMPOSITIONS

Robert D. Jerabek, Glenshaw, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 317,864, Dec. 22, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,592

Int. Cl.² C25D *13/06*

U.S. Cl. 204—181 16 Claims

1. A method of electrocoating an electrically-conductive surface serving as a cathode comprising passing an electric current between said cathode and an anode in electrical contact with an aqueous electrodepositable composition, wherein said electrodepositable composition comprises an aqueous dispersion of:

A. a quaternary onium salt group-containing resin comprising the reaction product of:

1. an epoxy group-containing reaction product of an epoxy group-containing organic material and a semi-capped organic polyisocyanate; and
2. a reactant selected from the group consisting of an amine acid salt, a sulfide-acid mixture, and a phosphine-acid mixture, said reactant reacted with said epoxy group-containing reaction product in an amount and at a temperature sufficient to provide a quaternary onium salt-containing, water-dispersible resin;

said quaternary onium group salt-containing resin (A) containing hydroxyl groups and capped isocyanate groups, said capped isocyanate groups stable at room temperature but reactive with hydroxyl groups at elevated temperatures; and

B. a catalytic amount of a catalyst for urethane formation.

3,935,088

ELECTROPHORETIC ENAMELLING OF FERROUS ARTICLES

Friedel Kaup, Gutersloh, and Heinrich Warnke, Marienfeld, both of Germany, assignors to Miele & Cie, Gutersloh, Germany

Continuation-in-part of Ser. No. 179,203, Sept. 9, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 393,823

Claims priority, application Germany, Sept. 12, 1970, 2045265

Int. Cl.² C25D *13/02*, *13/20*

U.S. Cl. 204—181 8 Claims

1. A method for the electrophoretic coating of a ferrous article with a vitreous enamel comprising the steps of (a) coating said article with from 0.3 to 5 g/sq. m. of zinc or 0.01 to 2 g/sq. m. of copper, (b) electrophoretically coating the metal-coated article with vitreous enamel, and (c) firing said enamel.

3,935,089

OXYGEN SENSOR COATED WITH CATALYTIC MATERIAL

Kinmochi Togawa, Zushi; Kazuo Matoba, Yokohama; Hiroshi Takao, Kamakura, and Yoshitaka Hata, Fujisawa, all of Japan, assignors to Nissan Motor Company Limited, Japan

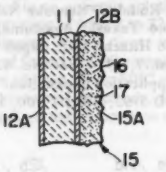
Filed July 18, 1974, Ser. No. 489,539

Claims priority, application Japan, July 24, 1973, 48-83283

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S 9 Claims

1. An oxygen sensor to sense the difference in oxygen content between two gases, comprising a layer of a solid oxygen-ion electrolyte, a first metal electrode formed on a side of said electrolyte layer to communicate with a reference gas, a second metal electrode formed on the opposite side of said electrolyte layer to communicate with the gas being measured, both said first and second electrodes being permeable to gas, and a porous coating formed on said second electrode, said coating being of an inorganic material comprising at least a major amount of at least one refractory oxide and impregnated with a catalyst for oxidation of oxidizable components



in said gas said refractory oxide comprises at least a substantial amount of Al_2O_3.

3,935,090

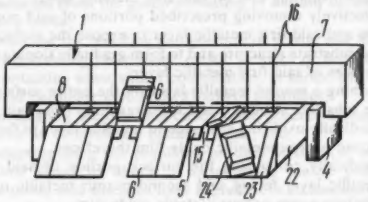
COVERING OF AN ALUMINUM-PRODUCING ELECTROLYSIS CELL

Dmitry Pavlovich Petrusenko, ulitsa Degtyareva, 25, kv. 32; Lev Grigorievich Andreev, ulitsa Dzerzhinskogo, 22, kv. 12, and Alexandr Mikhailovich Epshtein, prospekt Lenina, 22, kv. 77, all of Vologograd, U.S.S.R.

Filed Mar. 15, 1974, Ser. No. 451,603

Int. Cl.² C25C *3/08*, *3/22*

U.S. Cl. 204—243 R 5 Claims



1. An aluminium-producing electrolysis cell having vertical side walls and provided with holders for block-type preburnt anodes, comprising: a hood for gathering and extracting volatiles, located above said cell and having side walls whose edges are parallel to the cell side walls; slidable lids adjacent to one another and arranged inclinedly at the lower edges of said side walls of the hood; inclined guideways for each of said lids, made fast at the edges of said walls of the hood; drive shafts arranged along said electrolysis cell behind said anode-holders; levers secured on said drive shafts; double-arm right angle hangers, wherein one of the arms of each hanger is arranged along one of said levers pivotally round the longitudinal axis of said lever, while the other arm is articulated to the top end face of said lid and rests with its loose end upon the adjacent lever.

3,935,091

DEVICE FOR DETACHING AN ELECTROLYTICALLY PERCIPITATED METAL SHEET FROM A CATHODE

Pentti J. Rautimo, Helsinki, and Aarne A. Kapanen, Pori, both of Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Oct. 17, 1973, Ser. No. 407,208

Claims priority, application Finland, May 17, 1973, 1607/73

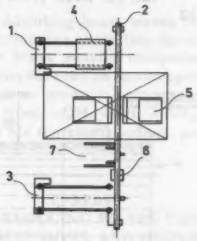
Int. Cl.² C25D *1/00*, *17/00*

U.S. Cl. 204—281 3 Claims

1. A device for detaching an electrolytically precipitated metal sheet, especially a copper, nickel or zinc sheet, from a base plate working as a cathode, which comprises

means for holding the base plate rigidly in an essentially vertical position,

blades mounted for limited downward movement to initially detach the upper edge of the precipitated metal sheet at least locally from the base plate by movement of said blades between said upper edge and said base plate, gripping jaws, for gripping the detached upper edge, a horizontal pulling device comprising a carriage having wheel



means movable along generally horizontal rails, said carriage being connected to the gripping jaws, and said carriage being provided with driving members for creating horizontal movement along said rails to an extent sufficient to detach the entire precipitated sheet from the base plate.

3,935,092

PURIFICATION OF A CHLORIDE SOLUTION

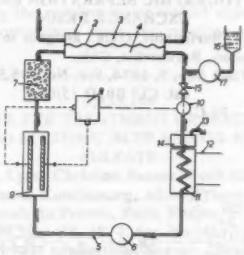
Jean Bizot, Essonne, and André Sausse, Hauts-de-Seine, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 315,196, Dec. 14, 1972. This application Mar. 21, 1974, Ser. No. 453,532

Claims priority, application France, Dec. 14, 1971, 71.44868

Int. Cl.² C25D 21/00

U.S. Cl. 204—234 **2 Claims**



1. Apparatus for the purification of blood, said apparatus comprising a haemodialyzer, a first and second chamber in said haemodialyzer, a membrane separating said first and second chamber, means for producing a pressure differential between said first and second chamber, an inlet and an outlet for said second chamber, a purification closed loop connected to said inlet and outlet said loop including (i) means to circulate a solution of sodium chloride around said loop, (ii) an electrolyzer and, (iii) a separator permitting the removal from the closed loop of gases and of a volume of liquid and means to supply a direct current to said electrolyzer.

3,935,093

BITUMEN BLOWING

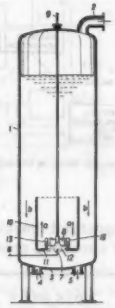
Hans Senolt; Heinrich Tomaschko, and Georg Palvik, all of Vienna, Austria, assignors to Osterreichische Mineralolverwaltung Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 78,035, Oct. 5, 1970, abandoned. This application Dec. 14, 1972, Ser. No. 315,008

Claims priority, application Austria, Oct. 3, 1969, 9332/69

Int. Cl.² C10G 27/00

U.S. Cl. 208—6 **3 Claims**



1. A bitumen blowing method comprising: providing a body of bitumen, providing a spatially defined central portion in said body of bitumen, blowing air into said spatially defined central portion at a pressure sufficient to overcome the hydrostatic pressure of the bitumen, thereby producing within the body of bitumen an upward flow of a mixture of bitumen and air and a corresponding downward flow of bitumen relatively poor in air compared to the upwardly flowing mixture and mechanically agitating the upwardly flowing mixture within the spatially defined central portion to disperse the air therein.

3,935,094

MAGNETIC SEPARATION OF ILMENITE

Michel Bergeron, Tracy, and Stephen Frederick Prest, St-Lambert, both of Canada, assignors to Quebec Iron and Titanium Corporation - Fer et Titane du Quebec, Incorporated, Sorel, Canada

Filed Oct. 10, 1974, Ser. No. 513,893

Int. Cl.² B03C 1/02

U.S. Cl. 209—8 **8 Claims**

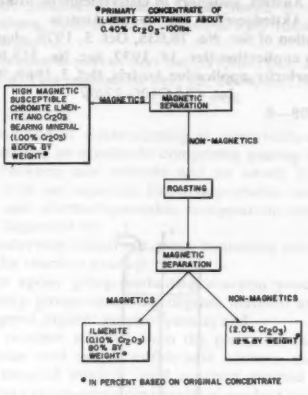
1. In a method for purifying ilmenite ore containing combustibles, the improvement comprising the steps of:

a. separating magnetically an ilmenite ore having liberated chromites present as impurities to remove magnetically susceptible chromium bearing minerals;

b. heating the thus treated ilmenite at a temperature from 690°C to 810°C for a period of at least ten minutes, said heating being in the presence of excess oxygen;

c. separating magnetically the thus heated ilmenite as the

more magnetically susceptible species from the impurities therein;


*PRIMARY CONCENTRATE OF ILMENITE CONTAINING ABOUT 0.40% Cr_2O_3-100%.
HIGH MAGNETIC SUSCEPTIBLE CHROMITE ILMENITE AND Cr_2O_3 BEARING MINERAL (1.00% Cr_2O_3) 8.00% BY WEIGHT*
MAGNETICS
MAGNETIC SEPARATION
NON-MAGNETICS
ROASTING
MAGNETIC SEPARATION
MAGNETICS
NON-MAGNETICS
ILMENITE (0.10% Cr_2O_3) 80% BY WEIGHT*
(2.0% Cr_2O_3) 12% BY WEIGHT*
* IN PERCENT BASED ON ORIGINAL CONCENTRATE

e. recovering the magnetized ilmenite product having the reduced amount of chromites present.

3,935,095

STRONG FIELD MAGNETIC SEPARATORS

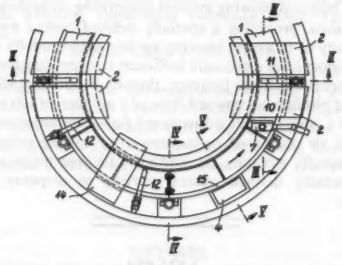
Wilhelm Susse, Krefeld, and Heinz Alter, Rheinhausen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 30, 1973, Ser. No. 355,866

Claims priority, application Germany, May 5, 1972, 2222003

Int. Cl.[2] B03C *1/12*

U.S. Cl. 209—222 **2 Claims**



1. A strong field magnetic separator for separating materials of different weak magnetic properties from each other, which includes in combination: a plurality of coreless magnetic coils operable to induce high intensity magnetic fields in the space within said coreless magnetic coils, said magnetic coils including an even number of coreless magnetic coils each two successive magnetic coils having poles of the same polarity facing each other, container means including induction poles and being movable within the space surrounded by said coreless magnetic coils, conveying means for conveying materials to be separated from each other into said container means, means for withdrawing separated materials of different magnetic properties, said container means including a plurality of containers respectively forming chambers of a circular ring rotatable about its vertical central axis, and driving means operatively connected directly to the periphery of said ring.

3,935,096

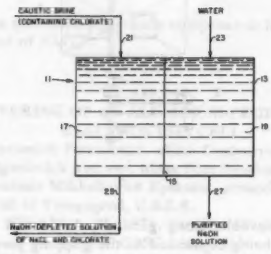
PRODUCTION OF AQUEOUS METAL HYDROXIDE SOLUTIONS OF LOW METAL HALIDE CONCENTRATION

Jeffrey D. Eng, North Vancouver, and Cyril J. Harke, Burnaby, both of Canada, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,116

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—22 **10 Claims**



1. A method of separating metal hydroxide from metal halide in an aqueous solution of metal hydroxide, metal halide and halate which comprises diffusing the metal hydroxide from the solution through a cation-active permselective membrane of a material selected from the group consisting of the hydrolyzed copolymer of a perfluorinated olefin and a fluorosulfonated perfluorovinyl ether, one-side modified, derivatives thereof and sulfostyrenated perfluoroethylene-propylene to produce an aqueous metal hydroxide diffusate solution of low metal halide concentration.

3,935,097

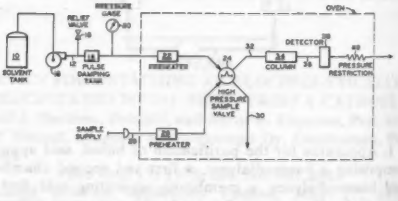
ACID AND ALCOHOL CARRIER FOR HF-H_2O CHROMATOGRAPHIC SEPARATION USING ANION EXCHANGE RESIN

Lewis B. Roof, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 7, 1974, Ser. No. 495,509

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—31 C **10 Claims**



1. A process for separating HF, water, and acid soluble oil comprising passing a sample containing said HF, water and acid soluble oil through a high pressure liquid chromatographic column packed with a weakly basic anion exchange resin in a carboxylate form utilizing as a carrier a liquid mixture of a normally liquid saturated aliphatic carboxylic acid in a normally liquid saturated aliphatic alcohol.

3,935,098
ADSORBENT PROCESS FOR HEAVY METALS

Nakaaki Oda; Yoshio Horie; Mitsuru Idohara, and Shozo Iwasa, all of Takaoka, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed June 28, 1973, Ser. No. 374,341
Claims priority, application Japan, July 4, 1972, 47-66931
Int. Cl.² B01D *15/00*
U.S. Cl. 210—38 6 Claims

1. A process for adsorbing heavy metals or heavy metallic compounds which comprises contacting liquid or gas containing heavy metal or heavy metallic compounds with a resin prepared by a reaction between an an aldehyde, a dithiocarbamate compound and an aromatic compound having at least one group selected from —OH, —SH, —NH_2, —COOH, and —COOMe wherein Me represents sodium, potasium, NH_4 or calcium.

3,935,099
METHOD OF REDUCING WATER CONTENT OF EMULSIONS, SUSPENSIONS, AND DISPERSIONS WITH HIGHLY ABSORBENT STARCH-CONTAINING POLYMERIC COMPOSITIONS

Mary Ollidene Weaver, Peoria; Edward B. Bagley, Morton; George F. Fanta, Peoria, and William M. Doane, Morton, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 3, 1974, Ser. No. 456,911
Int. Cl.² C02B *1/14;* C02C *5/02;* C08L *3/00*
U.S. Cl. 210—43 9 Claims

1. A method of reducing the water content of emulsions, comprising:

a. providing an aqueous-fluid absorbing composition comprising water-insoluble alkali salts of aqueous alkali saponified gelatinized-starch-polyacrylonitrile graft polymers which contain gelatinized starch (GS) and saponified polyacrylonitrile (HPAN) in molar ratios of from about 1:1.5 to 1:9 GS:HPAN, said water-insoluble alkali salts of aqueous alkali saponified gelatinized-starch-polyacrylonitrile graft polymers being further characterized as water-insoluble solids capable of absorbing in excess of 300 parts of water by weight per part of said water-insoluble solids,

b. mixing an emulsion with the aqueous fluid-absorbing composition, and

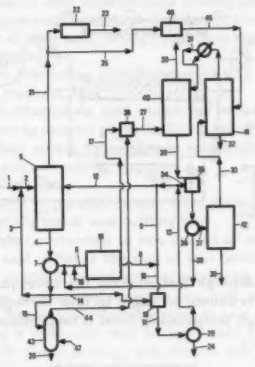
c. separating the resuling water-soaked aqueous-fluid absorbing composition from the resulting water-reduced emulsion.

3,935,100
PROCESS FOR THE TREATMENT OF WASTE WATERS CONTAINING SULFURIC ACID AND/OR AMMONIUM SULFATE

Jacques Alagy, Lyon; Christian Busson, Rueil Malmaison, and Maurice Cessou, Communarg, all of France, assignors to Institut Francais du Petrole, Paris, France

Filed June 28, 1974, Ser. No. 484,228
Claims priority, application France, June 29, 1973, 73.24127; Dec. 4, 1973, 73.43318; Mar. 6, 1974, 74.08095
Int. Cl.² C02B *1/34;* C02C *5/06*
U.S. Cl. 210—45 24 Claims

1. A process for treating waste water containing sulfuric acid and/or ammonium sulfate, comprising the steps of : (a) reacting the waste water with ash-containing solid barium sulfide recovered from the following step (c) and with an aqueous solution of barium sulfide recovered from the following step (e), to form a suspension of ashcontaining solid barium sulfate in the waste water at a pH of 3 – 7, the proportions of said solid barium sulfide from step (c) and said barium sulfide supplied as solution from step (e) being respectively 70 – 95 percent and 5 – 30 percent of the total barium sulfide, (b) reacting the resulting barium sulfate with coal or coke containing 0.1 – 20 percent b.w. of ash, at 700°– 1500°C, to form ash-containing solid barium sulfide and a gas containing H_2S and SO_2 which is separated, (c) recycling to step 1 at least the major portion of the ash-containing solid barium sulfide formed in step (b), and (d) admixing water with a minor portion of the ash-containing solid barium sulfide formed in



step (b), thereby obtaining a barium sulfide solution and insoluble ash, separating said barium sulfide solution from said insoluble ash and (e) recycling at least one portion of the barium sulfide solution obtained in step (d) and separated from the ash to step (a).

3,935,101
CLARIFICATION PROCESS

William Scott Briggs, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Division of Ser. No. 305,821, Nov. 13, 1972, Pat. No. 3,857,830. This application July 22, 1974, Ser. No. 490,482
Int. Cl.² C02B *1/20*
U.S. Cl. 210—47 11 Claims

1. In a process for the clarification of an aqueous suspension of solid particle matter wherein a flocculating agent is added in a sufficient amount to flocculate the suspended particle matter the improvement which cimprises using as a flocculating agent a water-soluble lignin-di-epoxide reaction product obtained by reacting at a pH in range of 8-13 and a temperature in the range of 50° to 220°C a lignin solution containing 20–50 percent lignin with a long-chained di-epoxide having a molecular weight in the range of 120 to 1800 to the extent that the phenolic hydroxyl content of the lignin has been reduced from 40 to 95%, said di-epoxide having linking atoms selected from the group consisting essentially of carbon, nitrogen, sulfur, and oxygen and being a terminal di-epoxide with epoxy groups being on the terminal ends of the long chain, said terminal ends being alkylene groups of at least 3 carbon atoms.

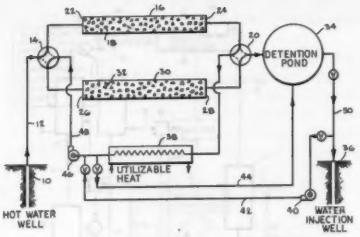
3,935,102
GEOTHERMAL POWER SYSTEM AND METHOD

Judson S. Swearingen, 500 Bell Air Road, Los Angeles, Calif. 90024

Filed Dec. 13, 1973, Ser. No. 424,470
Int. Cl.² F03G *7/02;* B01D *21/00*
U.S. Cl. 210—83 9 Claims

1. A method of extracting heat from hot unrefined water containing impurities comprising the steps of: alternately cocurrently flowing volumes of said unrefined water and volumes of clean liquid through a housing containing porous material whereby heat is alternately transferred from said unrefined water to said porous material and from said porous

material to said clean liquid, and extracting heat from said clean liquid subsequent to its flow through said housing, wherein a high temperature front moves along the length of said housing as each of said volumes of unrefined water is



passed therethrough and wherein the subsequent volume of clean liquid is caused to begin to flow through said housing when said high temperature front is intermediate the ends of said housing.

3,935,103

APPARATUS FOR SEPARATING LOW-DENSITY LIQUID FROM A RELATIVELY MORE DENSE LIQUID SUBSTANTIALLY IMMISCIBLE THEREWITH

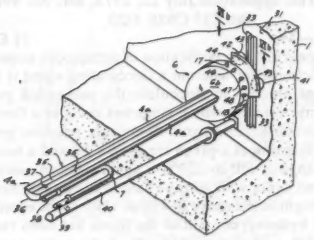
Karl Disque; Helmut Hölzgen, and Philipp Stauch, all of Neustadt, Germany, assignors to Erdol-Raffinerie Neustadt GmbH & Co., Neustadt, Germany and King-Wilkinson, Inc., Tulsa, Okla.

Filed Dec. 3, 1973, Ser. No. 421,492

Claims priority, application Germany, Dec. 2, 1972, 2259141

Int. Cl.² E02B *15/04*

U.S. Cl. 210—97 **6 Claims**



1. In a device for withdrawing a light liquid from a heavy liquid upon which the light floats, especially for the removal of oil from water, in which a longitudinally extending trough having a width which is small relative to its length and formed at least in part with an upwardly open channel cross section, is supported in the liquids by floats so that it can be immersed in the liquids to enable only the upper liquid to flow from above into the open upper part of the channel cross section while the heavier liquid is drawn off through an outlet below the trough, the upper edges of the side walls of the trough are horizontal and parallel to one another and lie close to the liquid surface while the longitudinal axis of the trough parallel to these upper edges lies substantially at the level of the liquid surface and the bottom of the trough is formed by parts which converge toward one another and are inclined to the axis of the trough toward a lower outlet opening from which a discharge device leads to the lighter liquid from the trough, the improvement wherein:

the trough is disposed in a vessel containing the liquids to be separated to a variable height;

the floats are disposed at the ends of the trough and close these ends while being provided with means for raising and lowering the trough relative to the liquid levels;

at least one of the floats is provided with an end face juxtaposed with a confronting side wall of the vessel and so connected thereto that the trough is movable relative to the bottom of the vessel upwardly and downwardly and is swingable about its longitudinal axis over a limited angular range in opposite senses from an intermediate position;

in the intermediate position the upper edges of the lateral walls of the trough both lie above the level of the lighter liquid in the vessel and block the admission of both liquids into the trough; and

the floats are provided with means for selectively canting the trough in one sense or the other about its axis to selectively immerse the respective upper edge of the trough beneath the surface of the lighter liquid, the latter means including a pair of trim chambers formed in one of said floats, means connecting said trim chambers for liquid communication therebetween, and means for transferring liquid between said chambers without altering the total quantity of liquid in said chambers.

3,935,104

AUTOMATIC FOAM REMOVER FOR FLOTATION TANKS

Charles E. Russell, Wayne; Fred E. Russell, Elgin, and Melvin B. Pearson, Hoffman Estates, all of Ill., assignors to Waste Water Systems, Inc., Hoffman Estates, Ill.

Filed Mar. 20, 1974, Ser. No. 453,174

Int. Cl.² B01D *21/24*

U.S. Cl. 210—97 **5 Claims**

1. In a flotation tank of substantially rectangular cross-section for treatment of waste water therein by causing the formation of gas bubbles which rise through the waste water body carrying insoluble and immiscible matter in the waste water with them to the surface of said body to form a layer of foam, froth or sludge on said surface which is maintained at a constant level by overflow means connected with the tank, an automatic foam remover comprising:

a. a hollow beam extending horizontally across the top portion of said tank between two opposite side walls thereof and having its bottom edge at a distance above said waste water level with a downwardly open slot extending along said bottom edge,

b. an elongate substantially flat-faced vane mounted within said hollow beam for pivotal movement on a horizontal axis above said slot and extending downwardly through said slot to a level below the surface of said waste water body, said slot being of significantly greater width than the thickness of said vane,

c. conduit means providing communication between a vacuum source and the interior of said hollow beam,

d. means at the ends of said beam supporting said beam for translatory movement on guide rails provided on said

tank and extending along said two opposite side walls thereof,

e. a horizontal shaft rotatably mounted on the outside of said tank and extending transversely of said guide rails,

f. a sprocket wheel secured to each end of said shaft,

g. an endless drive chain trained over each of said sprocket wheels and over an idler sprocket wheel at the opposite side of the tank,

h. drive means operatively connected with said shaft for moving said endless drive chains in synchronism with each other continuously in one direction,

i. a first horizontal lateral projection on each of said chains in alignment with each other,

j. a second horizontal projection on each end of said beam and extending longitudinally of said beam outwardly above the top edge of said tank,

k. link means connecting said first and second projections at each end of said beam, said link means being of variable effective length to permit variation of the distance between said first and second projections as said first projections pass around the sprocket wheels in the reversal of the direction of movement of said beam,

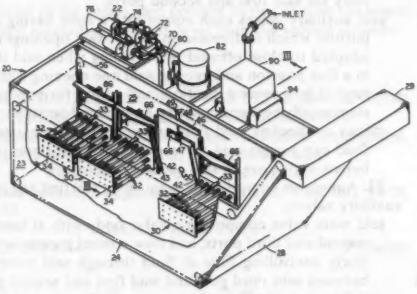
whereby movement of said beam in one direction tends to cause compression of the foam in front thereof and thereby causes said vane means to pivot into engagement with the rear edge of said slot and thus subjects said foam in front of the vane means to the suction action of said vacuum source and thereby causes discharge of said foam through said conduit means, the operation being repeated during the reverse movement of said beam, this time with said vane means in engagement with the other edge of said slot.

3,935,105

TUBULAR FILTER IN SETTLER

Stephen N. McEwen, Bowling Green, Ohio, assignor to Henry Manufacturing Co., Inc., Bowling Green, Ohio

Filed Nov. 12, 1974, Ser. No. 523,035
Int. Cl.² B01D *27/12, 29/32*
U.S. Cl. 210—138 **29 Claims**



1. In an apparatus for separating solid particles from a liquid comprising: a settling tank having an apertured side wall, a filter in said settling tank, and pump means for sucking said liquid through said filter from said tank, the improvement comprising:

A. an assembly having an open sided chamber and a plurality of horizontal tubular filter elements comprising said filter communicating with said chamber,

B. releasable clamping means for holding the open side of said chamber in fluid tight communication with said side wall around said aperture in said side wall of said tank, and

C. duct means connecting said aperture to said pump means.

18. A separator for solid particles in a liquid, comprising:

A. a settling tank having

a. a vertical wall with an outlet therein,

b. means for removing the settled particles from the bottom of said tank, and

c. filter means in said tank attached to said vertical wall,

B. a clean liquid tank adjacent said settling tank,

C. pump means connected to said outlet for removing liquid from said settling tank through said filter means into said clean tank,

D. means for precoating said filter means with a suspended filtration medium, and

E. means connected to said outlet for backwashing said filter means to remove periodically accumulated particles on said filter means for settling in said settling tank;

the improvement comprising:

in said filter means:

a. a plurality of parallel tubular filter elements mounted horizontally inside said settling tank,

b. a chamber connected to one end of all said elements and to said outlet in the wall of said settling tank,

c. means attached to said wall for removably holding said chamber against said outlet in said wall, and

d. gasket means around an aperture in said chamber for insuring a fluid type seal between said chamber and side wall of said settling tank around said outlet; and

in said precoating means:

a. means for dispersing said precoat medium in said liquid from said pump means,

b. duct means for directing liquid containing said precoat medium to above and adjacent said filter means for direct deposit on said filter means; and

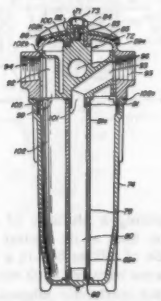
F. means for controlling the cycle of operation of said separator for periodically backwashing and precoating said filter means.

3,935,106

WATER FILTER ASSEMBLY

Herbert D. Lipner, 166 26th St., Park Forest, Ill. 60466

Continuation-in-part of Ser. No. 435,849, Jan. 23, 1974, abandoned. This application July 19, 1974, Ser. No. 490,136
Int. Cl.² B01D *29/10*
U.S. Cl. 210—232 **4 Claims**



1. A water filtering apparatus comprising:

a valve rotor, having an inlet bore and an outlet bore, said inlet and outlet bores communicating respectively with oppositely disposed entering and exiting openings in said rotor;

a housing for said rotor, said housing having therein housing entering and housing exiting openings corresponding to those of said rotor and communicating therewith when said rotor is in filtering position, positioned such that if said valve rotor be rotated, said rotor entering opening and said rotor exiting opening may be discommunicated

thereby from said housing entering opening and said housing exiting opening respectively;

a filter tank detachably, sealably mounted to said housing;

a hollow, elongated filter element having permeable walls defining a central cavity, said filter element mounted in said filter tank with one end thereof opening into one said bore of said rotor; and

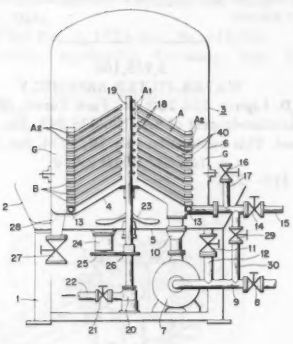
automatic vacuum relief means for releasing the vacuum created within said filter tank when said entering and exiting openings of said rotor have been discommunicated from said entering and exiting openings of said housing, whereby said apparatus may be more easily disassembled; said automatic vacuum relief means comprising a vacuum opening in said filter tank communicating said filter tank with the ambient atmosphere; and a vacuum seal covering said vacuum opening when said valve rotor is in filtering position discommunicatable therefrom when said valve rotor is rotatably positioned in bypass configuration.

3,935,107

FILTER

Aisaburo Yagishita, No. 5-2, Shinho-cho 4-chome, Chigusa, Nagoya, Aichi, Japan

Filed Dec. 18, 1973, Ser. No. 425,829
Int. Cl.² B01D *23/00, 23/24, 29/00*
U.S. Cl. 210—243 7 Claims



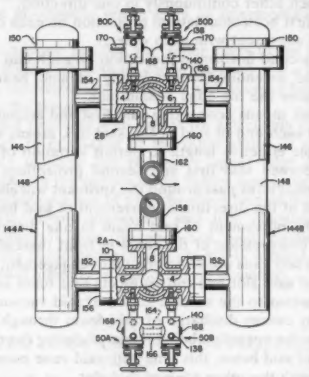
1. A filter comprising a plurality of screen plates, each having a penetration hole at its central portion, said plates being disposed inside of a filter box in a stacked form with a predetermined distance between each said plate such that the penetration holes are vertically aligned, pump means for pumping a raw liquid from an input pipe connected thereto through said penetration holes, wherein the raw liquid to be filtered is fed through said penetration holes onto the central portion of each of said screen plates and flows towards the peripheral portion thereof such that the filtrate is collected at a plurality of portions disposed at nearly equal intervals on the peripheral portion of each of said screen plates, a rotary jet shower pipe positioned within said penetration holes such that said jet shower pipe does not contact the edges of said penetration holes, and collector means operatively coupled to said peripheral portion of said screen plate for collecting and removing the filtrate collected on said peripheral portions of said screen plates.

3,935,108

CHANGEOVER VALVES WITH BYPASS AND BENT VALVING

Louis V. Forgues, Lunenburg, Mass., assignor to Paris-Cramer Company, Fitchburg, Mass.

Filed Oct. 7, 1974, Ser. No. 512,520
Int. Cl.² B01D *27/10*; F16K *11/22*
U.S. Cl. 210—340 22 Claims



1. Apparatus comprising:

a plug valve and first and second auxiliary valves mounted to said plug valve;

said plug valve comprising a valve body having a chamber for receiving a valve plug and at least a first port and a second port communicating with said chamber, first and second openings in said valve body intersecting said first and second ports respectively, and a valve plug rotatably mounted in said chamber, said valve plug having a passageway for controlling flow of fluid through said valve body via said first and second ports;

said auxiliary valves each comprising a stem having a stop portion which is disposed in one of said openings and is adapted to close off said one opening when said stem is in a first position and to open said one opening when said stem is in a second position, and means for moving said stem axially between said first and second positions; and

means connecting said first and second openings so that fluid can bypass said valve plug when the stems of said bypass valves are in said second positions.

22. Apparatus comprising a main valve and first and second auxiliary valves;

said main valve comprising a valve body with at least first, second and third ports, and flow control means for selectively controlling flow of fluid through said valve body between said third port and said first and second ports;

said first and second auxiliary valves each comprising a stem with a valve head, and means for axially and non-rotatably reciprocating said stem; and

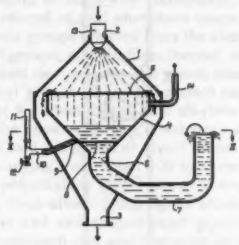
means defining first and second openings in said valve body communicating with said first and second ports respectively, and means defining first and second valve seats in said valve body for the valve heads of said first and second auxiliary valves respectively;

the stems of said first and second auxiliary valves being disposed in said first and second openings respectively so that the valve heads of said first and second auxiliary valves engage said first and second valve seats respectively and block off said first and second openings respectively when said stems are in a first position and are disengaged from said first and second valve seats respectively and unblock said first and second openings when said stems are in a second position.

3,935,109
STRAINING APPARATUS

Lars-Goran Rundqvist, Tumba, and Karl Folke Olof Jakobson, Taby, both of Sweden, assignors to AB Celleco, Tumba, Sweden

Filed Oct. 18, 1973, Ser. No. 407,589
Claims priority, application Switzerland, Oct. 25, 1972, 13740/72
Int. Cl.² B01D 35/00
U.S. Cl. 210—406 5 Claims

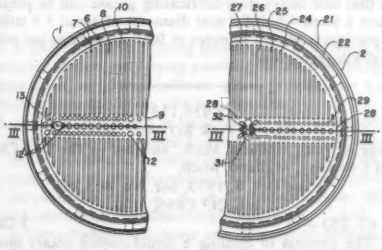


1. In a straining apparatus for separating fibres and the like from a liquid, the combination of a vessel having an outlet, a first strainer forming one wall of the vessel, means for spraying the fibre-containing liquid on to the outside of said strainer wall, means for evacuating said vessel, a second strainer having a smaller total area than the first strainer and covering said outlet from the vessel, said outlet being situated lower than said strainer wall, said second strainer having an inlet side, and means for maintaining, during operation of the straining apparatus, a liquid column covering said inlet side of the second strainer and forming a free liquid surface between the two strainers, the mesh openings of the second strainer being larger than the mesh openings of the first strainer but small enough so that fibres passing through the first strainer due to rupture thereof will rapidly obstruct the second strainer, the combination comprising also an outlet conduit connected to said outlet of the vessel, said conduit having outside the vessel a portion located at a higher level than the second strainer.

3,935,110
ENCLOSED FILTERING UNIT FOR FILTERING AND/OR TREATING LIQUID OR GASEOUS MEDIA

Paul Schmid, and Albert Droesch, both of Riehen, Switzerland, assignors to GHH Basel AG, Basel, Switzerland

Filed Nov. 2, 1973, Ser. No. 412,413
Claims priority, application Switzerland, Feb. 21, 1973, 2468/73
Int. Cl.² B01D 29/16
U.S. Cl. 210—445 9 Claims

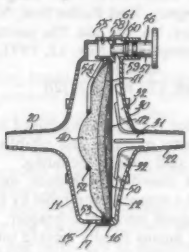


1. A fluid treating unit comprising:
1. a first plate-shaped member having a major face formed wtih a plurality of grooves therein, said member being formed with an opening therethrough transverse to said major face and communicating with said grooves;
2. a second plate-shaped member having a major face formed with a plurality of grooves therein, said second member being formed with an opening therethrough transverse to the major face of said second member and communicating with the grooves in the major face of said second member;
3. a layer of treating material permeable to the fluid to be treated and having two opposite surfaces respectively engaged by said major faces and bounding said grooves in said major faces;
4. sealing means connecting said plate-shaped members and therewith constituting a chamber enclosing said layer;
5. a first conduit communicating with said opening in said first member and constituting an inlet path of flow into said chamber for a fluid to be treated;
6. a second conduit communicating with said opening in said second member and constituting a discharge path of flow from said chamber for the treated fluid, (a) said paths being transverse to said major faces,
7. first guide means in said chamber at said opening of said first member for deflecting fluid entering said chamber from said first conduit in said inlet path into a direction substantially parallel to the major face of said first member and for thereby preventing erosion of said layer; and
8. second guide means in said chamber at the opening of the second member for deflecting fluid flowing in a direction substantially parallel to the major face of said second member in the grooves of said second member into said discharge path.

3,935,111
DEVICE FOR REMOVING BLOOD MICROEMBOLI

Donald J. Bentley, Newport Beach, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Filed Apr. 6, 1973, Ser. No. 348,588
Int. Cl.² B10D 25/00
U.S. Cl. 210—446 16 Claims

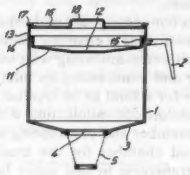


1. A device for removing microemboli from whole blood or the like comprising: a casing with an interior chamber and with a flow inlet to and a flow outlet from the chamber; a plurality of effective layers of microemboli-removing material positioned in said chamber and sealed to the inner periphery of the casing to require blood flow therethrough in travel of the blood from the flow inlet to the flow outlet, said effective layers each consisting of foamed open cell polyurethane to define tortuous flow passages therethrough, said effective layers having progressively smaller effective pore sizes whereby the blood in flowing therethrough has the microemboli of a size to block passages in a layer prevented from flowing thereto by adherence to the walls of the passages in a preceding layer.

3,935,112
REUSABLE COFFEE FILTER

Albert Greutert, Sachseln, Switzerland, assignor to Interelectric AG, Sachseln, Switzerland

Filed July 8, 1974, Ser. No. 486,626
Claims priority, application Germany, July 12, 1973, 2335506
Int. Cl.² B01D 35/28
U.S. Cl. 210—456 3 Claims



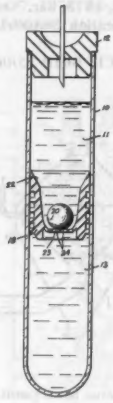
1. A reusable coffee filter comprising:
a. a pot-shaped hot water container having a bottom wall defining an opening of a diameter smaller than the diameter of the hot water container;
b. a frustro-conical filter strainer made of metallic sieve sheets depending from the opening in said pot-shaped hot water container, the bottom of said frustro-conical strainer comprising a horizontal sieve sheet; and
c. a water distribution pan supported within said hot water container by means located at the top thereof, said pan having a bottom wall containing a large number of small holes distributed over a portion of the bottom wall vertically aligned with the opening in said hot water container and somewhat smaller in extent than that opening.

3,935,113
SERUM/PLASMA SEPARATOR WITH CENTRIFUGAL VALVE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,364. The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.
Int. Cl.² B01D 21/26
U.S. Cl. 210—516 2 Claims

1. A separator device for separating mixed light phase and heavy phase constituents of blood and establishing a permanent barrier between said phases, including:
a tubular container closed at both ends, one of said ends being closed with a stopper penetrable by a needle for the introduction of blood into said container;
elastomeric barrier means fixedly located intermediate the container ends and dividing the container into first and second chambers such that upon separation of the blood into the light phase and the heavy phase by the application of centrifugal force, the first chamber contains only the light phase;
a passageway through the barrier means connecting the first and second chambers;
a ball in said first chamber having a specific gravity greater than the heavy phase of the blood; and
a stretchable diaphragm integral with the base of the barrier means and extending across the passageway, at least one normally closed aperture in the diaphragm, the diaphragm normally sealing off the passageway to provide a barrier between first and second chambers, and when subjected to a predetermined centrifugal force, the ball causes the diaphragm to stretch in the direction of the second chamber to open the apertures to provide communication between the chambers to permit the light phase to travel to the first chamber and the heavy phase to travel to the second chamber, and upon cessation of the applied centrifugal force, the diaphragm returns to its normal unstretched position to close the apertures and seal off the passageway and provide a barrier between the first and second chambers; said ball normally resting on the upper surface of said diaphragm.



3,935,114
LOW-WEAR GREASE FOR JOURNAL BEARINGS

Ruel M. Donaho, Jr., Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 292,021, Sept. 25, 1972, abandoned.
This application Dec. 4, 1974, Ser. No. 529,302
Int. Cl.² C10M 3/18, 5/14, 7/20, 7/24
U.S. Cl. 252—18 11 Claims

1. A heavy duty lubricating grease consisting essentially of a substantially uniform dispersion including:
a. a multi-purpose heavy duty hydrocarbonaceous lubricant thickened by a calcium acetate complex to form a lubricating grease that is stable at high temperature and that has an ASTM worked penetration of no less than 265; and effective and synergistic amounts of:
b. powdered molybdenum disulfide; and
c. powdered metallic oxide; said metallic oxide being selected from the group consisting of antimony trioxide; and a mixture of substantially equal parts of antimony trioxide, zinc oxide, lead oxide, nickel oxide, tungsten trioxide, vanadium pentoxide and copper oxide;
such that said heavy duty lubricating grease can be prepared to have a Shell 4-ball EP scar diameter of about 1.4 millimeters maximum after 5 minutes at 900 revolutions per minute at 500 kilograms load.

3,935,115
COOLANT FOR ROTARY ENGINE

George A. Paul, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1973, Ser. No. 403,705
Int. Cl.² C09K 5/00
U.S. Cl. 252—73 2 Claims

2. The process of cooling a liquid-cooled rotary internal combustion engine comprising circulating in the cooling system thereof an aqueous solution of propylene glycol monomethyl ether containing about 25–70% by volume of the ether.

3,935,116
FUNCTIONAL FLUID COMPOSITIONS

Martin B. Sheratte, Reseda, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

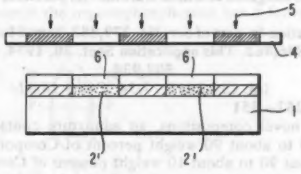
Continuation-in-part of Ser. No. 230,131, Feb. 28, 1972. This application Mar. 11, 1974, Ser. No. 449,623
Int. Cl.² C09K 3/00; C10M 3/40
U.S. Cl. 252—78 15 Claims

1. A functional fluid composition consisting essentially of (1) a combination of at least two phosphate esters, one of said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures thereof, and a second of said phosphate esters containing at least two aromatic groups selected from the class consisting of aryl and alkaryl groups, and mixtures thereof, and (2) a combination of at least two polyalkylene glycol ethers containing terminal oxyalkyl groups wherein the alkyl radicals contain from 1 to about 8 carbon atoms, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, one of said polyalkylene glycol ethers having a molecular weight ranging from about 500 to about 2,000, and a second of said polyalkylene glycol ethers having a molecular weight ranging from above 2,000 up to about 25,000, said phosphate esters and said polyalkylene glycol ethers being present in amounts such that said composition has a viscosity at −65°F of not greater than about 6,000 centistokes, and a viscosity at 210°F of not less than 2.25 centistokes.

3,935,117
PHOTOSENSITIVE ETCHING COMPOSITION

Gyoji Suzuki, and Takeshi Tomotsu, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 174,825, Aug. 25, 1971. This application Nov. 26, 1973, Ser. No. 419,010
Claims priority, application Japan, Aug. 25, 1970, 45-74488
Int. Cl.² C03C 15/00; C09K 13/00; G03C 5/00
U.S. Cl. 252—79.1 3 Claims

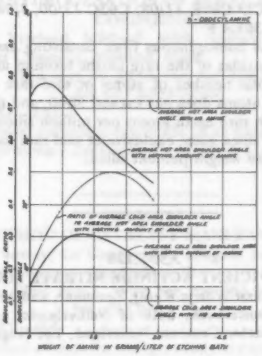


1. A photosensitive etching solution for fabricating a semiconductor device, employing a coating of silicon nitride, borosilicate glass, or phosphosilicate glass, provided on a silicon semiconductor substrate which comprises:
1. a compound which is capable of being decomposed by light to liberate a material which etches said coating, said decomposable compound being selected from the group consisting of tritylfluoramine, tetrafluorohydrazine, tri-n-butyl-tin-fluoride, α, α, α, trifluorotoluene, trifluoriodomethane, trifluorotrichloroethane, and p,p′-difluorodiphenylsulphone or a compound obtained from the reaction between the photodecomposed material and other material in the solution which etches said coating,
2. a binder, and
3. a solvent.

3,935,118
NITRIC ACID SYSTEM FOR ETCHING MAGNESIUM PLATES

David L. Czirr, Cresskill, N.J., and Harry Kroll, Warwick, R.I., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

Continuation-in-part of Ser. No. 337,879, March 5, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,342
Int. Cl.² C09K 13/06
U.S. Cl. 252—79.4 56 Claims



1. An etching liquid for etching bare areas of a magnesium plate, other portions of which are covered with an etch-resist pattern, said etching liquid including
I. a strong inorganic acid,
II. at least one liquid fatty monocarboxylic acid having from 6 to 26 carbon atoms and substantially non-reactive with the inorganic acid,
III. at least one organophosphonic acid,
IV. at least one alkylaryl sulfonic acid,
V. at least one surfactant or coupling agent, and
VI. water.

17. An etching liquid for etching bare areas of a magnesium plate, other portions of which are covered with an etch-resist pattern, said etching liquid including
I. a strong inorganic acid,
II. at least one liquid fatty monocarboxylic acid having from 6 to 26 carbon atoms and substantially nonreactive with the inorganic acid,
III. at least one polycarboxylic acid having from 2 to 10 carbon atoms,
IV. at least one alkylaryl sulfonic acid,
V. at least one surfactant or coupling agent,
VI. at least one salt of an acyclic or an alicyclic amine having at least 6 carbon atoms, and there being essentially absent from the etching liquid sulfonates and sulfates of fatty monocarboxylic acids, and
VIII. water.

3,935,119

LUMINESCENT DEVICE, PROCESS, COMPOSITION, AND ARTICLE

Stephen W. Barber, Toledo, Ohio, and William F. Nelson, Port Washington, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 203,495, Nov. 30, 1971, Pat. No. 3,855,144, Continuation of Ser. No. 41,455, May 28, 1970, Pat. No. 3,634,711, which is a division of Ser. No. 841,690, July 1, 1969, Pat. No. 3,527,711, which is a continuation-in-part of Ser. Nos. 355,248, March 27, 1964, Ser. No. 355,251, March 27, 1964, Ser. No. 355,253, March 27, 1964, Ser. No. 355,407, March 27, 1964, Ser. No. 355,408, March 27, 1964, Ser. No. 355,409, March 27, 1964, Ser. No. 355,421, March 27, 1964, Ser. No. 355,422, March 27, 1964, Ser. No. 355,444, March 27, 1964, Ser. No. 355,445, March 27, 1964, Ser. No. 355,469, March 27, 1964, Ser. No. 355,470, March 27, 1964, and Ser. No. 355,471, March 27, 1964.

This application Jan. 29, 1973, Ser. No. 327,529

Int. Cl.[2] C09K *11/08*; C03C *13/00*, *3/04*

U.S. Cl. 252—301.4 F 4 Claims

1. A vitreous homogeneous fiber consisting essentially of silica and the oxides of the rare earths terbium and cerium, wherein the total number of atoms of said rare earths per million silicon atoms does not exceed 5000, and the number of each of such rare earth atoms per million silicon atoms is at least 5, said silica glass, exclusive of said rare earth oxides, being at least 99 weight percent silica.

3,935,120

ANION-DEFICIENT ACTINIDE NITRATE SOLUTION

Johannes Bastiaan Willem Kanij, Zevenaar, and Arend Jaman Noothout, Oosterbeek, both of Netherlands, assignors to Stichting Reactor Centrum Nederland, The Hague, Netherlands

Filed May 30, 1973, Ser. No. 365,197

Claims priority, application Netherlands, June 5, 1972, 7207572

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 R 8 Claims

1. A method for the preparation of a concentrated anion deficient actinide nitrate solution, the actinide metals being chosen from the group of four valent plutonium, hexavalent uranium and four valent thorium, wherein undesired precipitates of UO_3 hydrates are avoided, by dissolving one or more oxides from the group PuO_2, UO_3, U_3O_8, UO_2 or lower oxides than UO_2, located between UO_2 and UO_3 in molten $UO_2(NO_3)_2.6H_2O$ or molten $Th(NO_3)_4.4H_2O$ and mixtures thereof at a temperature of at least 60°C, whereafter the obtained melt is diluted with water to the desired concentration.

3,935,121

FOAM CONTROL COMPOSITIONS FOR AQUEOUS SYSTEMS, ITS PREPARATION, AND PROCESS USING SAME

Hillel Lieberman, Warminster; Anthony J. Graffeo, Willow Grove, and John S. Kucsan, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 29, 1973, Ser. No. 374,835

Int. Cl.[2] B01D *19/04*

U.S. Cl. 252—321 4 Claims

1. A process for preparing a foam control composition for aqueous systems, said composition consisting essentially of from about 1% to about 10% of an amide, from about 1% to about 10% of an emulsifier, from about 88% to about 98% of a liquid hydrocarbon carrier, and from 0% to about 2% of a silicone oil, which process comprises:

a. Combining the amide, the emulsifier, and from about 1/5 to about ⅘ of said liquid hydrocarbon carrier;

b. Heating the amide, emulsifier, and the liquid hydrocarbon carrier amount until a clear melt is obtained;

c. Rapidly adding to said melt the remainder of said liquid hydrocarbon carrier to cool the melt to a temperature of from about 150°F. to about 200°F.;

d. Allowing the cooled mixture to further cool to a temperature of from about ambient to about 135°F.; all said percentages being on a weight basis and wherein said amide is obtained by the reaction of a polyamine containing an alkylene group of from 2 to 6 carbons, with a fatty acid or a mixture of fatty acids, having an average composition of 6 to 22 carbons per acid molecule.

4. A process for controlling the foam of an aqueous system, which comprises adding to said system an effective amount of the product of claim 3.

3,935,122

GREASE COMPOSITIONS

Joseph J. Dickert, Jr., Lower Makefield Township, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 1, 1975, Ser. No. 563,997

Int. Cl.[2] C10M *1/40*, *3/34*, *5/22*, *7/38*

U.S. Cl. 252—33.2 13 Claims

1. A grease composition comprising a major proportion of an oil of lubricating viscosity and an amount of metal salts sufficient to thicken said oil to a grease consistency, which salts consist essentially of (a) at least one metal salt of a C-alkyl or alkenyl succinic acid, having from about 10 to about 30 carbon atoms in the alkyl or alkenyl group and (b), at least one metal salt of a C-alkyl or alkenyl succinimidoarylsulfonic acid, having from about 14 to about 30 carbon atoms in the alkyl or alkenyl group, the relative weight proportions of (a) to (b) being between 1:99 and 99:1.

3,935,123

POLYSILOXANE-POLYOXYALKYLENE COMPOSITIONS USED IN POLYURETHANE FOAM

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 279,883, Aug. 11, 1972, Pat. No. 3,846,462. This application Sept. 20, 1974, Ser. No. 507,934

Int. Cl.[2] B01F *17/54*; C08G *18/61*

U.S. Cl. 252—351 36 Claims

1. As novel compositons, an admixture containing from about 10 to about 90 weight percent of Component A and from about 90 to about 10 weight percent of Component B, said percentages being based on the total weight of A and B contained in the admixture, wherein:

Component A is a cyano-bearing polysiloxanepolyoxyalkylene copolymer having the average composition,

$$(R)_3SiO[(R)_2SiO]_x[(R)\underset{\underset{R'CN}{|}}{SiO}]_y[(R)\underset{\underset{E}{|}}{SiO}]_zSi(R)_3$$

where R is alkyl, R′ has at least two carbon atoms and is bivalent alkylene or an oxyalkylene group the oxygen atom of which is bonded to silicon, x has an average value from about 10 to about 200, y has an average value from about 3 to about 100, z has an average value from about 2 to about 30, and E comprises a polyoxyalkylene block the oxyalkylene content of which is constituted of from about 20 to about 65 weight percent of oxyethylene; and

Component B is a polyalkylsiloxane-polyoxyalkylene copolymer in which the polyoxyalkylene content is constituted of from about 20 to about 75 weight percent of oxyethylene.

3,935,124

ANTI-STICK COMPOSITION FOR COATING AND DETACKIFYING UNCURED RUBBER ARTICLES AND THE LIKE

Donnie R. Thene, Elberfeld; Robert J. O'Donoghue, Indianapolis, and Donald W. Terry, Noblesville, all of Ind., assignors to Miller Chemical Corporation, Evansville and Mid-State Chemical & Supply Corporation, Indianapolis, both of, Ind., part interest to each

Filed Jan. 2, 1974, Ser. No. 429,854
Int. Cl.² C08J 7/04; C08C 1/02
U.S. Cl. 252—382 29 Claims

1. A liquid composition for coating and thereby detackifying solid articles of uncured elastomeric materials initially having tacky surface characteristics, said composition comprising an aqueous slurry consisting essentially of:

a substantial proportion of finely divided particles of a kaolin clay;

a sufficient amount of a water-soluble soap to provide bridging and tieing between the charge sites on the kaolin particles and the tacky surfaces of the uncured articles to thereby adhere a layer of kaolin particles to the tacky surfaces; and

a sufficient amount of water to disperse said clay particles.

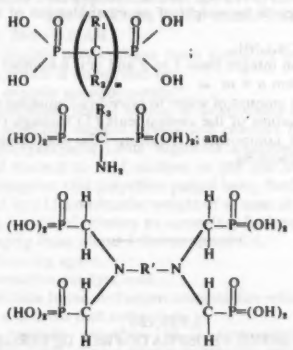
3,935,125

METHOD AND COMPOSITION FOR INHIBITING CORROSION IN AQUEOUS SYSTEMS

Jose T. Jacob, Lake Zurich, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Filed June 25, 1974, Ser. No. 482,941
Int. Cl.² C23F 11/16, 11/14
U.S. Cl. 252—389 A 5 Claims

1. A composition for inhibiting corrosion in aqueous systems, said compositions consisting essentially of watersoluble amine pyrophosphate, organophosphonate and triazole; wherein the amine pyrophosphate has from 2 to 10 carbon atoms; wherein the organophosphonate has a formula of the group consisting of:



wherein m is an integer from 1 to 10; R_1 is hydrogen, or alkyl group having from 1 to 4 carbons; R_2 is hydroxyl, hydrogen or alkyl group having from 1 to 4 carbons; R_3 is an alkyl group having 1 to 10 carbons, benzyl or phenyl, and R′ is an alkylene radical having from 1 to 10 carbons; and water soluble salts of these acids; and wherein the triazole is a member of the group consisting of benzotriazole; 1,2,3-triazole or derivative thereof having the formula:

where R is H or an alkyl group of 1–4 carbon atoms, or an aromatic group, or together from an aromatic or substituted aromatic ring; and water soluble salts, and wherein the amine pyrophosphate is present in an amount from about 0.5 to about 1,000 ppm; the organophoshonate is about 0.5 to about 1,000 ppm; and the triazole is about 0.5 to about 200 ppm of water.

3,935,126

CATALYST AND METHOD OF OXYDEHYDROGENATION OF ALKYL AROMATIC COMPOUNDS

G. Edwin Vrieland, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1974, Ser. No. 474,128
Int. Cl.² B01J 27/18
U.S. Cl. 252—437 6 Claims

1. A catalyst consisting essentially of an alkaline earth metal-nickel phosphate containing from about 61 to about 70% phosphate.

3,935,127

METHOD OF CATALYST MANUFACTURE

John E. Conway, La Grange, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 1, 1974, Ser. No. 484,519
Int. Cl.² B01J 23/16
U.S. Cl. 252—465 9 Claims

1. A method of manufacturing a catalytic composite of from about 4 to about 30 wt. % Group VIB metal in oxide form, from about 1 to about 10 wt. % Group VIII metal in oxide form and a refractory inorganic oxide carrier material which comprises:

a. dry mixing molybdenum oxide or finely divided Group VIB metal compound thermally decomposable to the metal oxide, Group VIII metal compound thermally decomposable to the metal oxide and a refractory inorganic oxide, said metal compounds being utilized in amounts to provide from about 60 to about 90% of said Group VIB metal in oxide form and from about 60 to about 90% of said Group VIII metal in oxide form;

b. peptizing the mixture and forming an extrudable dough;

c. extruding said dough and drying and calcining the extrudate;

d. impregnating the calcined extrudate with a Group VIB metal compound and a Group VIII metal compound, said metal compounds being thermally decomposable to metal oxides and being utilized in amounts to provide a final catalytic composite containing from about 4 to about 30 wt. % Group VIB metal in oxide form and from about 1 to about 10 wt. % Group VIII metal in oxide form; and

e. drying and calcining the resulting composite in an oxidizing atmosphere.

3,935,128

COPPER CHROMITE CATALYST AND THE PROCESS FOR PRODUCING IT

Marvin Michael Fein, Westfield, N.J.; Paul Alexander Colgate, Los Angeles, Calif., and Ronald Allan Kent, Ridgewood, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 30, 1974, Ser. No. 537,793
Int. Cl.² B01J 23/86
U.S. Cl. 252—467 17 Claims

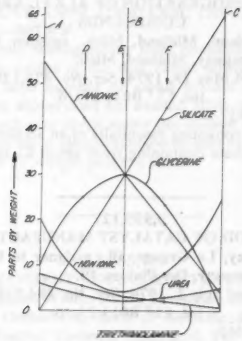
1. In a process for the production of copper chromite catalyst wherein a water soluble copper salt is reacted in solution

with a chromium compound selected from the group consisting of chromic acid, an alkali chromate and an alkali dichromate in the presence of ammonia to form a precipitate of a copper-chromium-nitrogen complex, the precipitate is recovered from the reaction mixture, washed, dried and calcined, the improvement which comprises, adding between about 0.5 and about 5 percent by weight of urea based on the copper calculated as the metal to the solution prior to precipitation.

3,935,129
LIQUID CLEANING COMPOSITIONS

Walter J. Jabalee, 44151 Lantern Lane, Apt. 1, Sterling Heights, Mich. 48077

Filed Oct. 25, 1973, Ser. No. 409,628
Int. Cl.² C11D 3/08
U.S. Cl. 252—525 **19 Claims**

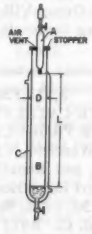


1. An aqueous detergent composition comprising zero to about 65 parts by weight of an alkali metal silicate and a combination of an anionic organic detergent, a non-ionic organic detergent, triethanolamine, glycerine, and urea; each in an approximate proportion relative to the proportion of said silicate as indicated in the drawing.

3,935,130
DETERGENT COMPOSITION FOR CLEANING BATHTUBS

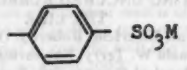
Satoshi Hirano, Fujieda; Jusha Tsumura; Izumi Imaseki, both of Tokyo, and Yoshimi Kawasaki, Fujieda, all of Japan, assignors to Kabushiki Kaisha Tsumura Juntendo, Tokyo, Japan

Filed July 12, 1973, Ser. No. 378,640
Claims priority, application Japan, July 19, 1972, 47-71629
Int. Cl.² C11D 1/94
U.S. Cl. 252—542 **6 Claims**

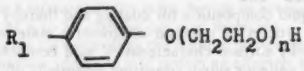


1. A detergent composition for bathtub cleaning which consists essentially of:

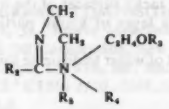
1. 100 parts by weight of a detergent base comprising 40 to 85% by weight of an alkylaryl sulfonate of the formula:



wherein R_o is an alkyl having 8 to 14 carbon atoms, and M is a salt-forming cation selected from the group consisting of ammonia, monoethanolamine, diethanolamine, and triethanolamine; 10 to 40% by weight of a polyoxyethylene alkylaryl ether of the formula:

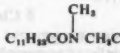


wherein R_1 is an alkyl having 8–9 carbon atoms, and n is an integer from 7 to 13; and 5 to 20% by weight of a cyclic imidinium compound of the formula:



wherein R_2 is an aliphatic hydrocarbon having 7 to 17 carbon atoms, R_3 is selected from the group consisting of hydrogen, alkali metals, CH_2COOH, CH_2COONa, and CH_2COOK, R_4 is a member selected from the group consisting of CH_2COOH, CH_2COONa, and

and R_5 is a member selected from the group consisting of OH,



$C_{12}H_{25}OSO_3$, and $C_{12}H_{27}(OC_2H_4)_3OSO_3$;

2. 9 to 30 parts by weight of a diethylene glycol monoalkyl ether of the formula:

$$R_6O(C_2H_4O)_2H$$

wherein R_6 is a lower alkyl having 1 to 4 carbon atoms, and

3. 2 to 15 parts by weight of an ethanolamine of the formula:

$$(HOCH_2CH_2)_nNH_m$$

wherein n is an integer from 1 to 3 and m is a number satisfying the equation $n + m = 3$;

4. sufficient amount of water to provide an aqueous solution of the mixture of the components (1) through (3), said detergent composition requiring little scrubbing in the bathtub cleaning.

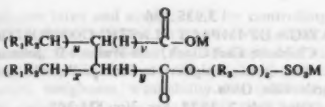
3,935,131
HIGH SUDSING PHOSPHATE-FREE DETERGENT COMPOSITION

Samuel H. Sharman, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 2, 1973, Ser. No. 375,998
Int. Cl.² C11D 1/29, 1/28, 3/20
U.S. Cl. 252—555 **6 Claims**

1. Detergent composition comprising

a. as a detergent-active component 1 part by weight of a compound of the formula



in which R_1 and R_2 are substantially linear saturated or unsaturated aliphatic groups of 3 to 19 carbon atoms, R_3 is alkylene of 2 to 4 carbon atoms, u, v, x, and y are 0 or 1, z is an integer 1 to 4, M is H or a water-soluble salt-forming cation, the sum of the carbon atoms in R_1 and R_2 is 13 to 21, the sum of the unsaturated sites in R_1 and R_2 is 0 to 1, the sum of u, and v is 1, The sum of x and y is 1, and the sum of u and x is 1, and

B. as a foam enhancing component, from 0.05 to 0.03 parts by weight of an essentially straight chain primary alcohol of 11 to 14 carbon atoms.

3,935,132
THERMOPLASTIC URETHANE POLYMER FILLED WITH CROSS-LINKED URETHANE POLYMER

Richard M. Gerkin; Rene Roberts, both of Charleston, and Joy C. Hodges, Chesapeake, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 15, 1974, Ser. No. 460,933
Int. Cl.² C08L *75/06, 75/08*
U.S. Cl. 260—2.5 BE **12 Claims**

1. A mixture, capable of being processed by thermoplastic polymer techniques, said mixture comprising an intimate blend of a previously produced thermoplastic urethane polymer and a comminuted crosslinked urethane polymer, said cross-linked urethane polymer being derived from a flexible urethane foam, a semi-rigid urethane foam, a rigid urethane foam, or a non-foamed urethane elastomeric polymer.

3,935,133
HIGH RESILIENCE POLYURETHANE FOAM STABILIZED WITH A SILICATE-BASED SURFACTANT COMPOSITION

Bruce G. van Leuwen, Trumbull, and Ralph A. Colafati, III, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 428,489, Dec. 26, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,549
Int. Cl.² C08G *18/14*; C08K *5/54*
U.S. Cl. 260—2.5 AH **16 Claims**

1. A flexible polyurethane foam prepared from a reaction mixture which is comprised of:

a. an organic polyisocyanate,

b. a polyether polyol having in its structure the nucleus of an aliphatic alcohol having 2–8 reactive hydrogens and polyoxyalkylene chain segments attached through one end thereof to said nucleus at the site of the reactive hydrogens, said polyether polyol being further characterized by (1) a molecular weight of at least about 4,000 and (2) a ratio of primary to secondary hydroxyl end groups ranging from about 1.5:1 to about 6:1,

c. a foaming agent,

d. a reaction catalyst, and

e. a silicate-based surfactant composition which is prepared by a process that comprises

1. reacting together, at a temperature of about 40°–200°C, (a) a silicon tetrahalide selected from the group consisting of silicon tetrachloride, silicon tetrabromide, and silicon tetraiodide, and, per every mole of said silicon tetrahalide (b) about 0.2–2.0 moles of water and (c) at least about one mole of an alcohol represented by the formula R_1OH wherein R_1 is alkyl of 2–20 carbon atoms or aromatic hydrocarbon of 6–14 carbon atoms, the reaction yielding a product made up of a volatile portion, which has a boiling point no greater than about 125°C at 10 mm of mercury pressure, and a non-volatile portion, and

2. removing said volatile portion, and

3. at a temperature of about 65°–320°C in the substantial absence of moisture and in the presence of a transesterification catalyst, reacting the non-volatile portion of the product of step (1) with a polyether alcohol having a molecular weight of about 500–5,000 and represented by the formula $R_4—C_nH_{2n}O—H$ wherein R_4 is alkyl of 1–10 carbon atoms and the moiety $—C_nH_{2n}O—$ represents a polyoxyalkylene chain consisting of from about 10 to 100 percent by weight of oxyethylene units, and, correspondingly, about 90–0 percent of oxypropylene units, oxybutylene units or a mixture of oxypropylene and oxybutylene units, said polyether alcohol being employed in a molar proportion ranging from about 0.006 to about 1.1 moles per every mole of said silicon tetrahalide which is used in step (1), with the proviso that the molar proportion of said polyether alcohol is no more than about 55% of the molar proportion of alcohol reacted in thre reaction of step (1).

3,935,134
HEAT-SEALING ADHESIVES

Manfred Dollhausen, Odenthal, and Gerhard Hohmann, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

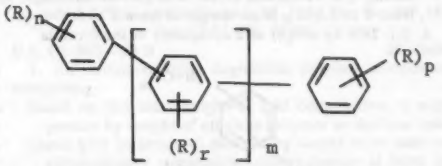
Filed Apr. 19, 1974, Ser. No. 462,308
Claims priority, application Germany, Apr. 25, 1973, 2320805
Int. Cl.² C08L *15/02, 7/00*
U.S. Cl. 260—3.5 **6 Claims**

1. An adhesive composition consisting substantially of

a. 0.5–30% by weight of a copolymer of ethylene and a vinyl ester having from 2 to 10 carbon atoms in the ester moiety, said vinyl ester being present in an amount of 35–70% by weight, based on the weight of said copolymer;

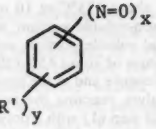
b. 0.5–30% by weight of a member selected from the group consisting of chlorinated polyisoprene, chlorinated polyethylene, chlorinated polypropylene and chlorinated natural rubber, each of said members having a chlorine content of 60–70% by weight;

c. 0.5–30% by weight of a compound of the formula



wherein each R is separately alkyl having 1 to 10 carbon atoms, alkoxy having 1 to 10 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, phenyl, phenylalkyl having 7 to 13 carbon atoms, alkylphenyl having 7 to 13 carbon atoms, phenoxy or phenalkoxy having 7 to 12 carbon atoms; n is zero or an integer of from 1 to 5; p is an integer of from 1 to 2; r is zero or an integer of from 1 to 4 and m is zero or an integer of from 1 to 3;

d. 0.1–24% by weight of a compound of the formula



wherein R′ is alkyl having 1 to 10 carbon atoms, alkanolamino having 1 to 10 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, phenylalkyl having 7 to 13 carbon atoms, phenyl, phenoxy, phenylamino having 6 to 12 carbon atoms, phenylnitrosoamino having 6 to 12 carbon atoms or halogen; *y* is zero or an integer of from 1 to 5 and *x* is 2 and

e. 30–90% by weight of at least one organic solvent.

3,935,135

HEAT-SEALING ADHESIVES

Manfred Dollhausen, Odenthal, and Gerhard Hohmann, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 19, 1974, Ser. No. 462,309

Claims priority, application Germany, Apr. 25, 1975, 2320804

Int. Cl.² C08L *15/02, 7/00*

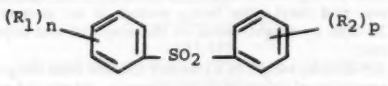
U.S. Cl. 260—3.5 **5 Claims**

1. An adhesive composition consisting substantially of

a. 0.5–30% by weight of a copolymer of ethylene and a vinyl ester having from 2 to 10 carbon atoms in the ester moiety, said vinyl ester being present in an amount of 35–70% by weight, based on the weight of said copolymer;

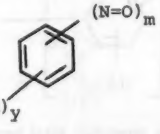
b. 0.5–30% by weight of a member selected from the group consisting of chlorinated polyisoprene, chlorinated polyethylene, chlorinated polypropylene and chlorinated natural rubber, each of said members having a chlorine content of 60–70% by weight;

c. 0.5-30% by weight of a compound of the formula



wherein R_1 and R_2 are each separately alkyl having 1 to 10 carbon atoms, alkoxy having 1 to 10 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, phenyl, phenylalkyl having 7 to 13 carbon atoms, phenoxy or phenalkoxy having 7 to 12 carbon atoms; *n* is zero or an integer of from 1 to 5 and *p* is an integer of from 1 to 5;

d. 0.1–24% by weight of a compound of the formula



wherein R is alkyl having 1 to 10 carbon atoms, alkoxy having 1 to 10 carbon atoms, alkanolamino having 1 to 10 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, phenylalkyl having 7 to 13 carbon atoms, phenyl, phenoxy, phenylamino having 6 to 12 carbon atoms, phenylnitrosoamino having 6 to 12 carbon atoms or halogen; *y* is zero or an integer of from 1 to 5 and *m* is 2 and

e. 30–90% by weight of at least one organic solvent.

3,935,136

PREPARATION OF IMPACT PLASTIC COMPOSITIONS

Clifford W. Childers; Earl Clark, and Wallace D. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 7, 1972, Ser. No. 224,309

Int. Cl.² C08L *7/00, 23/00, 9/00, 47/00*

U.S. Cl. 260—4 R **26 Claims**

1. A method of preparing high impact polymer compositions which comprises dissolving at least one unsaturated rubber in at least one polymerizable vinylidene group-containing monomer to form a rubber-in-monomer solution, suspension polymerizing said rubber-in-monomer solution in the presence of a monomer-soluble organic azo or peroxy free radical generating initiator and in the further presence of a peroxy free radical cross-linking agent under aqueous suspension polymerization conditions including a polymerization temperature sufficient to activate said monomer-soluble organic azo or peroxy free radical initiator and wherein said polymerization temperature is below the activation temperature of said peroxy free radical cross-linking agent, thereby preparing a graft polymer, recovering the so-prepared graft polymer from said suspension polymerization system, and cross-linking the so-recovered graft polymer with said peroxy free radical cross-linking agent under hot-mixing conditions sufficient to activate said peroxy free radical cross-linking agent, thereby preparing said high impact polymer composition,

wherein said unsaturated rubber is a natural rubber or synthetic rubber and where synthetic is a polymer of at least one conjugated diene of up to 12 carbon atoms per molecule; copolymer thereof with at least one monovinyl substituted aromatic compound, with at least 1-monoolefin of up to 8 carbon atoms per molecule, or with a nitrile group-containing monomer; and is characterized as having at least enough unsaturation to be vulcanizable,

wherein said vinylidene group-containing monomer is characterized as polymerizable in the presence of said unsaturated rubber by thermal polymerization or in the presence of a monomer soluble free-radical generating initiator, and said vinylidene group-containing monomers containing 3 to 30 carbon atoms per molecule and comprise monovinyl-substituted aromatic compounds, alpha,-beta-unsaturated nitriles, esters of acrylic acid, esters of alkacrylic acid, and vinyl esters, such that at least one said vinylidene group-containing monomer is an alpha, beta-unsaturated-nitrile,

wherein said aqueous suspension polymerization conditions include employment of water as the continuous phase therein and said rubber-in-monomer solution as the discontinuous phase therein.

3,935,137

PAINT COMPOSITION CONTAINING DENATONIUM BENZOATE AND LATEX RESIN BINDER FOR APPLICATION OVER OLD PAINT FILMS TO PREVENT INGESTION OF POISONS THEREFROM

Walter Minkoff, Rockville Centre, N.Y., assignor to Peerless Paint and Varnish Corporation, Brooklyn, N.Y.

Continuation of Ser. No. 345,071, March 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 267,623, June 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 115,796, Feb. 16, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 460,875

Int. Cl.² C08K *5/10;* **C09K** *3/00;* **C08L** *31/04, 1/26*

U.S. Cl. 260—17 R **11 Claims**

1. A coating composition for application to previously coated substrates consisting essentially of a paint containing 0.05% to 0.5% by weight of the non-volatile portion of said paint of the bitter tasting deterrent denatonium benzoate; 9.0% to 99.5% by weight of a resin binder selected from the group consisting of at least one of ppolyvinyl acetate-acrylic copolymer latex and a mixture of polyvinyl acetate-acrylic

copolymer latex and acrylic latex for controlling the amount of said deterrent released on contact with saliva; and an effective amount of a surfactant for stabilization of said paint, said coating composition having the visual appearance, durability, adhesion, toughness, washability and continuity of conventional paint and having a repulsive taste which discourages persons from licking, sucking, chewing, swallowing or otherwise mouthing said substrates.

3,935,138
PULVERULENT BINDERS

Frank Wingler, Leverkusen; Josef Pedain, Cologne; Richard Müller, Bergisch-Neukirchen; Rolf Dhein, Krefeld-Bockum, and Eckhard de Cleur, Duisburg, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed May 28, 1974, Ser. No. 473,391

Claims priority, application Germany, June 1, 1973, 2328013

Int. Cl.² C08F *18/14;* **C08K** *3/00*

U.S. Cl. 260—17 R **3 Claims**

1. A powdered coating agent comprising a mixture of

A. 96 to 80 parts by weight of a random addition copolymer having free hydroxyl groups of which 50 to 100 mol % thereof have been reacted with at least one aliphatic or cycloaliphatic dicarboxylic acid anhydride to obtain an acid number of 22 to 110 mg. of potassium hydroxide per g. of reaction product, said random addition copolymer before reaction with said anhydride being a copolymer of

I. 30 to 85% by weight of styrene, α-methylstyrene, o-chlorostyrene, p-chlorostyrene, p-tert.butylstyrene, methylmethacrylate or a mixture of at least two of said monomers,

II. 5 to 60% by weight of acrylic acid ester having 1 to 12 carbon atoms in the alcohol moiety, methacrylic acid ester having 2 to 12 carbon atoms in the alcohol moiety or a mixture thereof and

III. 10 to 30% by weight of a hydroxyalkyl ester of acrylic acid or methacrylic acid having 2 to 4 carbon atoms in the hydroxyalkyl moiety,

the sum of the percentage contents of I to III being 100 and the molecular weight of said copolymer of I to III being 3,000 to 20,000 and its hydroxyl number being 50 to 126 mg. of potassium hydroxide per g. of copolymer and

B. 4 to 20 parts by weight of triglycidylisocyanurate, a bisoxazoline or a trisoxazoline.

3,935,139
BINDER COMPOSITIONS

Ronald James Ashall, Wigan, England, assignor to Fibreglass Limited, St. Helens, England

Filed July 5, 1974, Ser. No. 486,070

Claims priority, application United Kingdom, July 18, 1973, 34199/73; Apr. 18, 1974, 17089/74

Int. Cl.² C08L *97/00;* **B32B** *17/10*

U.S. Cl. 260—17.5 **38 Claims**

1. In a method for producing a glass fibre product which includes the steps of flowing a plurality of streams of molten glass, attenuating the streams to a desired fibre diameter by means of a high velocity gaseous blast, treating the fibres with a binder composition comprising an A stage phenol-aldehyde condensate resin which resin has been polymerised in the presence of a catalyst selected from the group consisting of an alkali and an alkaline earth metal hydroxide, projecting the fibres onto a conveyor, and conveying the binder coated fibres through a curing stage whereby said binder is cured and said fibres are bonded to one another at points of contact, the improvement comprising utilising an acidic lignosulphonate to neutralise at least part of the alkali or alkaline earth metal hydroxide catalyst of said resin by adding said acidic lignosulphonate to said resin at a pH above 7.5.

3,935,140
NOVEL AQUEOUS COATING COMPOSITIONS

Tadahiro Go; Takashi Suzuki, and Masaaki Inoue, all of Kawasaki, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

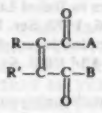
Filed Sept. 23, 1974, Ser. No. 508,124

Claims priority, application Japan, Oct. 4, 1973, 48-111680

Int. Cl.² C09D *3/52, 3/56, 5/40;* **C25D** *13/00*

U.S. Cl. 260—19 UA **11 Claims**

1. An aqueous coating composition comprising a water soluble or dispersible material prepared by addition reacting a mixture containing (1) 90–50 parts by weight of a natural drying oil and (2) 10–50 parts by weight of a liquid copolymer having a number average molecular weight of from 500 to 5000 and containing 90–50% by weight of 1,3-pentadiene polymerization units and 10–50% by weight of 1,3-butadiene polymerization units, the liquid copolymer being obtained by polymerizing a corresponding monomeric mixture of 1,3-pentadiene and 1,3-butadiene in the presence of a Friedel-Crafts type catalyst, with at least one α,β-unsaturated dicarboxylic compound represented by the following general formula



wherein R and R′ are each a hydrogen atom, halogen atom or alkyl group, and A and B are each a hydroxyl group, alkoxy group or —O— together formed by A and B with the proviso that A and B do not take an alkoxy group at the same time, thereby to form an addition product which is then neutralized to make it soluble or dispersible in water.

3,935,141
ENVIRONMENTALLY DEGRADABLE ETHYLENE POLYMERIC COMPOSITIONS

James Edward Potts, Bernards Township; Stephen Watson Cornell, Dunellen, and Albert Martin Sracic, Gladstone, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 184,206, Sept. 27, 1971, abandoned. This application June 28, 1972, Ser. No. 267,255

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 H **26 Claims**

1. An environmentally degradable polymer composition comprising,

based on the total weight of said composition, a major portion by weight of ethylene polymer as the base resin,

about 0.01 to about 40 percent by weight of at least one auto-oxidative susceptible additive having at least one hydrogen atom bonded to a carbon atom having an auto-oxidative susceptibility greater than that of a hydrogen atom bonded to a normal secondary carbon atom,

at least one salt of at least one polyvalent metal selected from the group consisting of titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc and cerium, in such amounts as to provide about 0.002 to about 2.0 percent by weight of the metal atom, and

about 0.0025 to about 1 percent by weight of antioxidant for said ethylene polymer.

3,935,142

SMOKE-RETARDANT POLYVINYLCHLORIDE COMPOSITIONS

Alfred P. Wilson, St. Charles Township, Kane County, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,540
Int. Cl.² C08G 6/00
U.S. Cl. 260—23 XA 6 Claims

1. A composition comprising a resinous polymer of vinyl chloride and a smoke-retardant concentration of ferrous trimellitate.

3,935,143

ABS RESIN COMPOSITION

Sakae Takahashi; Shiro Saeki, and Yoshio Onisawa, all of Sakai, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Apr. 16, 1973, Ser. No. 351,619
Claims priority, application Japan, Apr. 19, 1972, 47-39364
Int. Cl.² C08L 91/00
U.S. Cl. 260—23.7 R 7 Claims

1. An acrylonitrile/butadiene/styrene molding composition adapted for rotational molding which consists essentially of (A) substantially spherical acrylonitrile/butadiene/styrene resin particles of from 10 to 100 mesh size prepared by the bulk-suspension two stage polymerization process (e) said acrylonitrile/butadiene/styrene resin particles having uniformly dispersed and coated only on the surfaces thereof (B) particles of an organic compound additive having a particle size of less than 100 mesh, said additive having a melting point of 100° to 250°C and a thermal decomposition point above 200°C, the weight ratio of (A) to (B) being 100 : 0.1 to 5.0, and said organic compound being selected from the group consisting of compatible lubricants, anti-oxidants, plasticizers, flame retardants, ultraviolet absorbing agents, and mixtures thereof.

3,935,144

CONTACT ADHESIVES

Kurt Hagenweiler, and Kurt Scholz, both of Remagen-Kripp, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 3, 1974, Ser. No. 475,583
Claims priority, application Germany, June 5, 1973, 2328430
Int. Cl.² C08L 93/00
U.S. Cl. 260—24 10 Claims

1. A process for the manufacture of contact adhesives which comprises:

mixing (a) 28 to 94 percent by weight of a polyol having a molecular weight from 300 to 8,000 and a hydroxyl number from 20 to 85 and

(b) 5 to 60 percent by weight of an amorphous, thermoplastic, tackifier resin which has a softening point from 40° to 150°C. and a molecular weight from 200 to 7,500, without the addition of solvents; and

reacting the mixture, without the use of solvent, with (c) 1 to 12 percent by weight of 3-isocyanatomethyl-3,5,5-trimethylcyclohexylisocyanate,

the percentages by weight being based on the total weight of the components (a), (b) and (c).

3,935,145

PROCESS FOR THE MANUFACTURE OF MODIFIED NATURAL RESIN PRODUCTS

Albert Rudolphy, Wiesbaden-Biebrich, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 294,655, Oct. 3, 1972, Pat. No. 3,880,788. This application Mar. 26, 1973, Ser. No. 345,239
Claims priority, application Germany, Oct. 8, 1971, 2150216; Mar. 29, 1972, 2215235; Mar. 29, 1972, 2215293
Int. Cl.² C08L 93/00
U.S. Cl. 260—27 BB 10 Claims

1. A process for the manufacture of a natural resin product comprising reacting (a) a natural resin selected from the group consisting of colophony, wood resin, tall oil, abietic acid and levopimaric acid with (b) at least one ethylenically unsaturated monomer capable of being added to at least one of said natural resins, said monomer containing from 2 to 12 carbon atoms and being free from carboxylic groups and anhydride groups, and (c) an α, β-olefinically unsaturated carboxylic acid or a derivative thereof selected from the group consisting of anhydrides, esters and amides which provides carboxylic groups under the reaction conditions in an amount by weight equalling more than 5% of the weight of the natural resin, but less than the weight of (a) + (b); said resin product having a melting point of at least 97°C, being soluble in organic solvents and containing said natural resin in an amount equalling about 15–85% and said monomer in an amount equalling about 0.2 to 20%, both amounts being based on the total weight of the resin.

3,935,146

POLYURETHANEAMIDES DISPERSIBLE IN WATER AND DISPERSIONS CONTAINING THEM

Klaus Noll; Walter Schröer; Josef Pedain, and Helmut Reiff, all of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Mar. 18, 1974, Ser. No. 452,153
Claims priority, application Germany, Apr. 25, 1973, 2320719
Int. Cl.² C08G 18/12
U.S. Cl. 260—29.2 TN 15 Claims

1. In a process for preparing a polymer which is dispersible in water without an emulsifier which comprises reacting an organic diisocyanate with organic compounds in the molecular weight range of 300 to 6000 which are difunctional for the purpose of the isocyanate polyaddition reaction, contain hydrogen atoms which are reactive with isocyanate groups and do not contain any side chain polyethylene oxide units wherein (1) an organic compound which is difunctional for the purpose of the isocyanate polyaddition reaction, contains hydrogen atoms which are reactive with isocyanate groups, and contains side chain polyethylene oxide units, or (2) an organic diisocyanate or mixture of diisocyanates containing from about 5 mol percent to about 100 mol percent of diisocyanate which contains side chain polyethylene oxide units is included in the reaction mixture, the improvement wherein the said organic compounds having a molecular weight of 300 to 6000 contains from about 5% to 100% by weight of polyamide or polyester amide, the ratio of ester groups to amide groups in the polyester amide being not more than 15:1 and the ratio of the reactants being in such proportions that the resulting product contains about 0.5% to about 20% by weight of amide groups.

3,935,147
AQUEOUS PATTERN PAINT FROM CARBOXYLIC RESIN, N-ALDEHYDE RESIN, POLYSILOXANE RESIN AND FLUOROCARBON SURFACTANT

Henry W. Godshalk, Aurora, Ill., and Mohinder Paul Sharma, Wyoming, Mich., assignors to Henry W. Godshalk, Batavia, Ill.

Filed Mar. 18, 1974, Ser. No. 451,883
Int. Cl.² B44D 5/00; C08L 83/04
U.S. Cl. 260—29.4 R 11 Claims

1. A resinous composition for producing a pattern paint consisting essentially of an aqueous dispersion of (1) a water reducible resinous vehicle in which the resin is selected from the group consisting of a polyester resin containing carboxyl groups and a polyacrylic acid resin, (2) an amine-aldehyde or amide-aldehyde resin cross-linking agent for the resinous vehicle, (3) a fluorocarbon surfactant containing a group of the formula $CF_3—CF_2—CF_2—$ and (4) a polysiloxane resin having an average molecular weight of at least 2,000.

3,935,148
RECOVERY AND RECYCLE OF LATEX PRODUCED IN USED AQUEOUS SUSPENSION MEDIUM

Clifford W. Childers, and Earl Clark, both of, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 5, 1972, Ser. No. 312,331
Int. Cl.² C08L 9/00, 47/00; C08F 220/42, 110/02
U.S. Cl. 260—29.6 XA 9 Claims

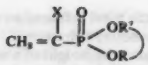
1. In the aqueous suspension graft polymerization in which at least one unsaturated elastomer and at least one vinylidene group containing monomer are reacted to form a polymerization product mixture comprising a graft polymer phase and an aqueous phase, the improvement comprising converting the unreacted monomers remaining in either phase after the suspension polymerization is complete to a polymer latex by adding to said product mixture a water-soluble polymerization initiator, then subjecting said product mixture to polymerization conditions which will cause the unreacted monomers to polymerize in the aqueous phase in response to said initiator to form a latex, separating the polymer latex from the graft polymer phase, the reaction conditons employed in both the suspension polymerization and the polymerization of the unreacted monomers being selected to that substantial amounts of gel are not formed, and using the polymer latex as at least a portion of the suspension medium for an ensuing aqueous suspension graft polymerization in which at least one unsaturated elastomer is grafted with at least one vinylidene group containing monomer.

3,935,149
FIRE RETARDANT AQUEOUS EMULSION COPOLYMER ADDITIVES

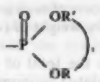
Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 160,905, July 8, 1971, abandoned, and a continuation-in-part of Ser. No. 49,204, June 23, 1970, abandoned. This application Apr. 8, 1974, Ser. No. 458,626
Int. Cl.² C08F 14/22, 30/02; D06M 15/32
U.S. Cl. 260—29.6 TA 7 Claims

1. An aqueous emulsion copolymer consisting of: (1) from about 1 to 90%, by weight, of at least one bis(hydrocarbyl) vinylphosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1–C_{18} alkyl and



wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups having non-interfering substitutents, said hydrocarbyl and said substituted hydrocarbyl groups containing up to about 18 carbon atoms inclusive with the proviso that R and R′ can be the same, different, or conjoint and (2) the balance being at least one halogen containing, ethylenically unsaturated compound selected from the group consisting of the vinyl halides and the vinylidene halides.

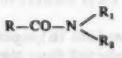
3,935,150
AQUEOUS POLYSTYRENE CONTAINING DISPERSIONS AS ANTI-STATICS FOR THE PERMANENT FINISHING OF FIBRE MATERIALS

Josef Oxe, Arlesheim, and Rudolf Keller, Rieben, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 226,511, Feb. 15, 1972, Pat. No. 3,835,148. This application June 4, 1974, Ser. No. 476,242
Claims priority, application Switzerland, Feb. 16, 1971, 2248/71
Int. Cl.² D06M 13/38, 15/26
U.S. Cl. 260—29.6 MN 11 Claims

1. A preparation for use in giving fiber materials a permanent antistatic and dirt-repellent finish, consisting essentially of an aqueous dispersion of

a. 10 to 20 % by weight of an antistatic agent comprising a compound of the formula



wherein R represent an alkyl radical having 8 to 22 carbon atoms, R_1 and R_2 are, each independently, alkyl, hydroxyalkyl, alkyl substituted by carboxylic and/or sulphonic acid groups, aminoalkoxyalkyl or aminoalkyl wherein the amino group is unsubstituted or substituted by hydroxyalkyl, cyanoalkylaminoalkyl or by the group R—CO— or —R—CO—NH-alkoxyalkyl wherein R is alkyl having 8 to 22 carbon atoms, or one of R_1 and R_2 is hydrogen,

b. 3 to 35 % by weight of an aqueous non-film-forming dispersion of polystyrene,

c. 1 to 6 % by weight of an inorganic or organic monobasic or polybasic acid, and

d. 0 to 5 % by weight of an antimicrobic agent.

3,935,151
BLENDED LATEX BINDER FOR EXTERIOR PAINTS WITH WET PRIMED ADHESION

Richard Gorham Nickerson, Weston; Robert Thomas Bouchard, Gardner; Paul Joseph Charles Hurtubise, Fitchburg, and Eugene Alfred Duchesneau, Jr., Ashburnham, all of Mass., assignors to Borden, Inc., Columbus, Ohio

Division of Ser. No. 410,129, Oct. 10, 1973. This application Aug. 5, 1974, Ser. No. 494,597
Int. Cl.² C08L 33/06, 27/06
U.S. Cl. 260—29.6 WB 6 Claims

1. A latex blend capable of conferring wet primed adhesion to paints comprising

I. up to about 85% of the total solids of an emulsion copolymer containing polymerized therein
  a. at least about 50 parts by weight of a monomer selected from the group consisting of vinyl acetate and vinyl chloride.
  b. sufficient monomer selected from the group consisting of C_1–C_{10} alkyl esters of acrylic and methacrylic acids, and the C_1–C_{10} alkyl diesters of maleic acid and fumaric acid to make 100 parts by weight of (a) and (b) monomers, and
  c. about 0.3-5% based on the total of said (a) and (b) monomers of a carboxylated monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, aconitic acid, methacrylic acid dimer, crotonic acid, isocrotonic acid, angelic acid, teglic acid, senecioic acid, hexenic acid and the C_1–C_{10} alkyl monoesters of maleic acid and fumaric acid; and

II. to make 100% of the total solids, at least about 15% of an emulsion copolymer chosen from the group consisting of

A. an emulsion copolymer containing copolymerized therein
  d. about 50-70 parts of vinyl chloride,
  e. about 30–50 parts of monomers selected from the group consisting of C_1–C_{10} alkyl diesters of maleic acid and fumaric acid to make 100 parts by weight of (d) and (e) monomers,
  f. about 0.3–5%, based on said (d) and (e) monomers, of a carboxylated monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, aconitic acid, methacrylic acid dimer, crotonic acid, isocrotonic acid, angelic acid, teglic acid, senecioic acid, hexenic acid and the C_1–C_{10} alkyl monoesters of maleic acid and fumaric acid, and
  g. sufficient hydroxymethyl diacetone acrylamide (HMDAA) to achieve an HMDAA level of at least about 0.40% with respect to total monomers in the entire latex blend; and

B. an emulsion copolymer containing copolymerized therein
  h. monomers selected from the group of monomers consisting of C_1–C_{10} alkyl diesters of maleic acid and fumaric acid,
  j. about 0.3–5% based on (h) monomers of a carboxylated monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, itaconic acid, aconitic acid, methacrylic acid dimer, crotonic acid, hexenic acid and the C_1–C_{10} alkyl monoesters of maleic acid and fumaric acid, and
  k, sufficient hydroxymethyl diacetone acrylamide (HMDAA) to achieve an HMDAA level of at least about 0.65% with respect to total monomers in the entire latex blend.

3,935,152

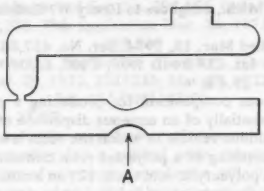
STYRENE-ACRYLONITRILE RESIN COMPOSITION HAVING GOOD PARTING PROPERTY

Yukio Hozumi; Akira Ohi, and Tatuhiko Imai, all of Sakai, Japan, assignors to Daicel Ltd., Osaka, Japan

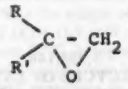
Filed May 6, 1974, Ser. No. 467,091
Claims priority, application Japan, May 10, 1973, 48-51903
Int. Cl.² C08K *5/15;* **C08F** *220/42, 220/70*
U.S. Cl. 260—30.4 N **4 Claims**

1. A thermoplastic synthetic resin molding composition, consisting essentially of

A. a copolymer of styrene and acrylonitrile, said copolymer having blended therein,



B. from 0.05 to 0.5 percent by weight, based on the weight of said copolymer, of one or a mixture of parting agents of the formula



wherein R and R′ each represent hydrogen or straight-chain alkyl, with the proviso that the sum of the carbon atoms in R and R′ is from 8 to 13.

3,935,153

PROCESS FOR PREPARING STYRENE RESINS CONTAINING POLYESTER PLASTICIZERS

Teizo Kudo; Yoshio Hashizume; Masatoshi Mikumo, and Masanori Itoh, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Continuation of Ser. No. 378,255, July 11, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,787
Claims priority, application Japan, July 31, 1972, 47-76591
Int. Cl.² C08K *5/11*
U.S. Cl. 260—31.6 **10 Claims**

1. In a method for producing a molding composition suitable for use in low-pressure low-shear molding techniques, which comprises carrying out a bulk-suspension two-stage polymerization of (A) monomer selected from the group consisting of (1) an aromatic monoalkenyl monomer and (2) a mixture of said aromatic monoalkenyl monomer with another monovinyl monomer, in the presence of (B) a butadiene rubber elastomer, the improvement which comprises incorporating in the polymerization mixture before the bulk polymerization stage, (C) from 1 to 10 wt. %, based on said monomer component (A), of a straight chain saturated polyester having an average molecular weight of 1000 to 50,000, said straight chain saturated polyester being selected from the group consisting of polyesters obtained by the condensation reaction of dibasic acids having up to 10 carbon atoms with alkylene glycols having 2 to 6 carbon atoms, and polyesters prepared by the ring-opening-polymerization of lactones of hydroxyalkanoic acids having up to 12 carbon atoms in the alkyl group.

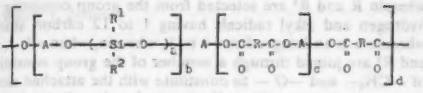
3,935,154

BLOCK COPOLYESTERS OF POLYSILOXANES

John Duval Cawley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 346,373, March 30, 1973, Pat. No. 3,861,915. This application Sept. 24, 1974, Ser. No. 508,800
Int. Cl.² C08K *5/02*
U.S. Cl. 260—33.8 SB **26 Claims**

1. A solvent-soluble block copolyester having a molecular weight of at least 10,000 and an inherent viscosity greater than 0.2 in chloroform, and having the formula:



wherein R is an alkylene radical containing at least 3 carbon atoms, A is selected from the group consisting of alkylene radicals containing from about 2 to about 25 carbon atoms, and arylene radicals containing from about 6 to about 25 carbon atoms derived from aromatic diols, R^1 is an alkyl radical containing from about 1 to about 10 carbon atoms, and R^2 is selected from the group consisting of R^1, phenyl, naphthyl, and anthracenyl and aralkyl wherein the alkyl portion contains from 1 to 10 carbon atoms and alkaryl wherein the alkyl portion contains from 1 to 10 carbon atoms, *b* is an integer of at least 1, *a* is an integer of at least 10, *c* is an integer of at least 2, and *d* is an integer of at least 2.

3,935,155

POLYMER MANUFACTURE

Desmond Wilfrid John Osmond, Windsor, and Morice William Thompson, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 5, 1973, Ser. No. 348,142

Claims priority, application United Kingdom, Apr. 14, 1972, 17250/72

Int. Cl.² C08K *5/01*; C08L *67/00*, *77/00*, *79/08*

U.S. Cl. 260—34.2 **15 Claims**

1. A process for the manufacture of a stable dispersion of particles of a polymer selected from the group consisting of polyesters, polyamides and polyimides in an inert organic liquid medium in which the polymer is insoluble by the polymerisation of one or more reactive monomers of which one monomer is solid at the temperature at which the polymerisation reaction takes place and is capable of existing as a stable dispersion of finely divided particles in the liquid medium at that temperature, and any remaining monomer has an appreciable solubility in the liquid medium at the polymerisation temperature, the process comprising the steps of (1) dispersing the said solid monomer in the inert organic liquid in the presence of monomer-stabilising agent so as to produce a stable dispersion of particles of the monomer having a mean diameter not greater than 50μ, the monomer-stabilizing agent being per se soluble in the inert organic liquid and incorporating (i) a polymeric component which is solvatable by the liquid and (ii) a grouping which is capable of becoming associated with the particles of the solid monomer and (2) heating the dispersion of solid monomer together with any remaining monomer or monomers at the polymerisation temperature, so as to bring about the polymerisation reaction, in the presence of a polymer-stabilising agent which is per se soluble in the inert organic liquid and incorporates (a) a polymeric component which is solvatable by the liquid and (b) a grouping which is capable of effecting association between the polymer-stabilising agent and the resulting polymer by reacting with a polymerizable grouping contained in at least one of the monomers from which the polymer is formed.

3,935,156

UNIT AND METHOD FOR SPRAY COOLING FLUID

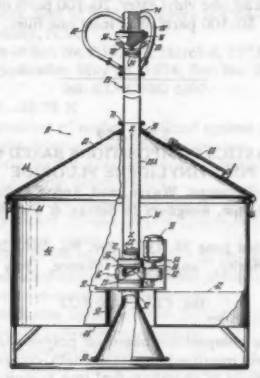
Harvey E. Richter, Farmington, Conn., assignor to The Tec Group, Inc., Bloomfield, Conn.

Filed Aug. 4, 1972, Ser. No. 277,988

Int. Cl. B01f *3/04*

U.S. Cl. 261—37 **3 Claims**

1. A modular fluid cooling unit for cooling a body of water and the like and comprising a generally cylindrical stationary tower having a flow passage therethrough with a discharge outlet at an open upper end of the tower and an inlet at its lower end, a power operated axial flow pump between upper and lower ends of the tower, the pump including a cylindrical rotor with an axial flow passageway coaxially aligned with the tower and forming part of its flow passage, the cylindrical rotor forcing fluid through the tower with a vortical motion of relatively high kinetic energy and under relatively low pressure, a velocity deflector mounted on the tower, the velocity deflector including a downwardly directed conical portion in coaxially fixed relation to the tower at its discharge outlet and jointly defining with the tower a substantially unobstructed



annulus permitting slinging of fluid in a 360° radiating spray pattern from the discharge outlet, the conical deflector portion amplifying the angular escape velocity of the fluid by at least partial deflection of the axial velocity of the fluid at the discharge outlet of the tower, a float structure for supporting the tower, the pump and the velocity deflector, the float structure including a fluid tight shell enveloping the pump, the shell extending above the water surface being of an inverted cone shape providing a downwardly sloping surface radiating in surrounding symmetrical relation to the tower for minimizing surface area exposed to wind for improved seaworthiness.

3,935,157

POLYCARBONATE RESIN HAVING IMPROVED ELECTRICAL TRACKING RESISTANCE

Paul Schiller, Krefeld, and Hugo Vernaleken, Krefeld-Uerdingen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Mar. 28, 1974, Ser. No. 455,842

Claims priority, application Germany, Sept. 11, 1973, 2345799

Int. Cl.² C08J *3/20*

U.S. Cl. 260—37 PC **5 Claims**

1. An electrical insulator having a minimum tracking resistance to leakage current of about 280 volts comprising an intimate blend of a high molecular weight thermoplastic polycarbonate based on an aromatic bis-hydroxy compound and 0.05% to 10% by weight of additives selected from the group consisting of oxides of vanadium, molybdenum, cerium, palladium, copper, silver, cobalt, nickel, and platinum.

3,935,158

ROAD MARKING PAINT COMPOSITIONS

Koichi Watanabe, Kawasaki, Japan, assignor to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 499,825
Claims priority, application Japan, Aug. 28, 1973, 48-96428
Int. Cl.² C08K 3/20, 3/30
U.S. Cl. 260—42.21 5 Claims

1. A hot-melt type road marking wax-free paint composition comprising, by weight, 100 parts of at least one aliphatic hydrocarbon resin having a softening point of 70°–160°C and being a cationically polymerized polymer of unsaturated hydrocarbons comprising a C_5 fraction as the main ingredients, 2.5–40 parts of at least one ethylene-vinyl ester copolymer having a melt index of 1.5–1,000 g/10 minutes and being a copolymer of 90–50% by weight of ethylene and 10–50% by weight of at least one vinyl ester, 20–100 parts of at least one pigment, and 80–500 parts of at least one filler.

3,935,159

PLASTICS COMPOSITIONS BASED ON POLYVINYLIDENE FLUORIDE

Edmond Demillecamps, Wavre, and André Orban, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed June 28, 1974, Ser. No. 484,628
Claims priority, application France, July 10, 1973, 73.25685
Int. Cl.² C08K 3/22
U.S. Cl. 260—42.27 4 Claims

1. A plastic composition based on polyvinylidene fluoride which possesses improved impact strength, comprising 0.05 to 6 parts by weight of rhombohedral iron sesquioxide per 100 parts of polyvinylidene fluoride.

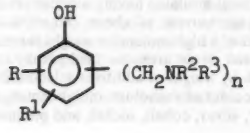
3,935,160

DIALKYLAMINOMETHYLPHENOLS AS CATALYST DEACTIVATORS FOR STEREOREGULAR DIENE POLYMERS

Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 356,693, May 2, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,666
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.8 NT 9 Claims

1. A process of preventing the oxidative degradation of elastomeric stereoregular polymers, a major portion of said polymer consisting of segmeric units derived from conjugated diolefinic monomers, said polymers containing transition metal catalyst residues, comprising adding a dialkylaminomethylphenol to the stereoregular polymer prior to exposure of the polymer to substantial oxidative degradation conditions, the dialkylaminomethylphenols having the following structural formula



wherein R and R^1 are selected from the group consisting of hydrogen and alkyl radicals having 1 to 12 carbon atoms, wherein n is an integer from 1 to 3, wherein, when n is 1, R^2 and R^3 are joined through a member of the group consisting of $-CH_2-$ and $-O-$ to constitute with the attached nitrogen atom a heterocyclic radical and wherein, when n is 2 or 3, R^2 and R^3 are selected from the group consisting of alkyl radicals having 1 to 4 carbon atoms, hydroxy alkyl radicals having 2 to 4 carbon atoms or can be joined through a member of the group consisting of $-CH_2-$ and $-O-$ to constitute with the attached nitrogen atom a heterocyclic radical and wherein the total number of substituents on the phenolic ring in addition to the hydroxy group is from 1 to 5, with the proviso that when the phenolic ring contains 4 or 5 substituents the radicals $-(CH_2NR^2R^3)_n$ are in ortho or para positions.

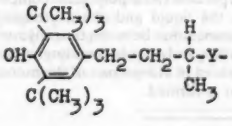
3,935,161

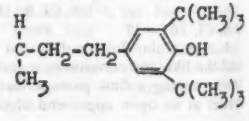
PROCESS FOR STABILIZING POLYAMIDES

Karl Schlichting, Bobenheim-Roxheim; Peter Horn; Johannes Schlag, both of Ludwigshafen, and Wolfgang Koernig, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

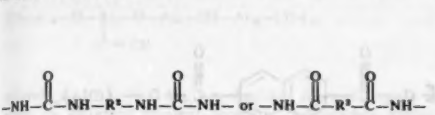
Division of Ser. No. 444,414, Feb. 21, 1974. This application Sept. 11, 1974, Ser. No. 504,873
Claims priority, application Germany, Feb. 24, 1973, 2309435
Int. Cl.² C08G 6/00
U.S. Cl. 260—45.9 NC 10 Claims

1. A process for stabilizing polyamides against oxidation and thermal degradation, which comprises adding thereto a stabilizing compound of the formula:





in which Y denotes



where R^2 is a radical derived from aliphatic, aromatic or aromatic/aliphatic diisocyanates and

is the diacyl radical of an aliphatic or aromatic dicarboxylic acid.

3,935,162

DIALKYL AROMATIC AMIDOMETHYL PHOSPHONATE FLAME RETARDANTS

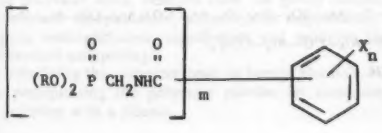
Peter Golborn, Lewiston, and James J. Duffy, Buffalo, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 393,868, Sept. 4, 1973, Pat. No. 3,895,161, which is a division of Ser. No. 239,784, March 30, 1972, Pat. No. 3,803,269. This application Dec. 11, 1974, Ser. No. 531,646

Int. Cl.[2] C08G 6/00

U.S. Cl. 260—45.9 NC 15 Claims

1. A process for rendering resin compositions flame retardant which comprises applying to said resin a flame retardant amount of a compound of the formula:



wherein R is selected from the group consisting of phenyl, lower alkenyl and halogen substituted and unsubstituted lower alkyl of 1–6 carbon atoms, X is selected from the group consisting of chlorine, bromine and lower alkyl of 1–6 carbon atoms, *m* is an integer from 1–4 and *n* is an integer from 0–5, provided that the sum of *m* and *n* is not greater than 6 and when *m* is 1, *n* is greater than 0.

3,935,163

LIGHT STABILIZED POLYMER COMPOSITIONS

John D. Spivack, Spring Valley, and Peter P. Klemchuk, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 339,474, March 8, 1973, abandoned. This application May 28, 1974, Ser. No. 473,605

Int. Cl.[2] C08G 6/00

U.S. Cl. 260—45.75 N 10 Claims

1. A composition of matter stabilized against oxidative and ultraviolet light deterioration which comprises

a. a synthetic organic polymer normally subject to ultraviolet and oxidative deterioration,

b. from 0.001 to 5% be weight based on the weight of polymer of a nickel 3,5-di-t-alkyl-4-hydroxybenzoate having up to 8 carbon atoms,

c. from 0.001 to 5% by weight based on the weight of polymer of an ultraviolet light absorber selected from

1. 2-hydroxy-4-n-octoxybenzophenone; or

2. a benzotriazole selected from 2-(2′-hydroxy-3′,5′-di-t-butylphenyl)-5-chlorobenzotriazole, 2-(2′-hydroxy-3,5-di-t-amylphenyl)benzotriazole or 2-(3′-t-butyl-2′-hydroxy-5′-methylphenyl-5-chlorobenzotriazole,

d. from 0.01 to 5% by weight based on the weight of polymer of a benzoate co-light stabilizer selected from n-octadecyl-3,5-di-t-butyl-4-hydroxybenzoate or 2,4-di-t-butyl-phenyl 3,5-di-t-butyl-4-hydroxybenzoate;

e. from 0 to 5% by weight based on the weight of polymer of a phenolic antioxidant selected from n-octadecyl-3,5-di-t-butyl-4-hydroxyphenylpropionate, tetrakis-methylene3-(3′,5-di-t-butyl-4′-hydroxyphenyl)propionate methane, di-n-octadecyl-3,5-di-t-butyl-4-hydroxyphosphonate, tris(3,5-di-t-butyl-4-hydroxybenzyl)isocyanurate or di-octadecyl-2-(3-t-butyl-5-methyl-4-hydroxybenzyl)malonate;

f. from 0 to 5% by weight based on the weight of polymer of an organo-sulfur compound selected from dilaurylthiodipropionate and distearylthiodipropionate, provided that said composition is synergistic in its activity.

3,935,164

LIGHT STABILIZED POLYMER COMPOSITIONS

John d. Spivack, Spring Valley, and Peter P. Klemchuk, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 339,458, March 8, 1973, abandoned. This application May 28, 1974, Ser. No. 473,633

Int. Cl.[2] C08G 6/00

U.S. Cl. 260—45.75 N 14 Claims

1. A composition of matter stabilized against oxidative and ultraviolet light deterioration which comprises

a. a synthetic organic polymer normally subject to ultraviolet and oxidative deterioration,

b. from 0.001 to 5% by weight based on the weight of polymer of a nickel 3,5-di-t-alkyl-4-hydroxybenzoate having up to 8 carbon atoms in the t-alkyl group,

c. from 0.001 to 5% by weight based on the weight of polymer of an ultraviolet light absorber selected from (1) 2-hydroxy-4-n-octoxybenzophenone, or (2) a benzotriazole selected from 2-(2'-hydroxy-3',5'-di-t-butylphenyl)-5-chlorobenzotriazole, 2-(2'-hydroxy-3,5-di-t-amylphenyl) benzotriazole or 2-(3'-t-butyl-2'-hydroxy-5'-methylphenyl)-5-chlorobenzotriazole,

d. from 0 to 5% by weight based on the weight of a polymer of a phenolic antioxidant selected from n-octadecyl 3',5'-di-t-butyl-4'-hydroxyphenyl) propionate, tetrakis-methylene 3-(3',5'-di-t-butyl-4'-hydroxyphenyl)propionate methane, di-n-octadecyl 3,5-di-t-butyl-4-hydroxybenzylphosphonate, tris(3,5-di-t-butyl-4-hydroxybenzyl-)isocyanurate, di-octadecyl-2-(3-t-bitu;-5-methyl-4-hydroxybenzyl)malonate, and 1,3,5-tris-(3,5-di-t-butyl-4-hydroxybenzyl)5-triazine-2,4,6-(IH,3H)-trione,

e. from 0 to 5% by weight based on the weight of polymer of an organosulfur compound selected from dilaurylthiodiproprionate and distearylthiodynapionate, provided that said composition is synergistic in its activity.

3,935,165

PROCESS FOR THE STABILIZATION OF POLYESTER AMIDES

Gerhard Schade, Witten, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

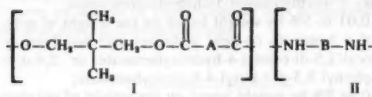
Continuation-in-part of Ser. No. 380,423, July 18, 1973, abandoned. This application Apr. 24, 1974, Ser. No. 463,917

Claims priority, application Germany, Apr. 26, 1973, 2321120; July 22, 1972, 2236041

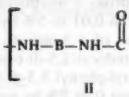
Int. Cl.² C08G 6/00

U.S. Cl. 260—45.85 B **6 Claims**

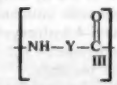
1. A stabilized polyester amide composition comprising a random polyester amide containing the following moieties:



I



II



III

where A is an aliphatic, cycloaliphatic or aromatic residue or mixtures thereof, B is an aliphatic or cycloaliphatic residue or mixtures thereof, and Y is an aliphatic or cycloaliphatic residue, the moieties I being present in an amount of 20 to 80 mole percent, the structural moieties II, III or moieties thereof being present in an amount of 80 to 20 mole percent, and a stabilizer composition consisting essentially of:

A. phosphorous acid, or an alkyl or aryl ester thereof,

B. triphenylphosphine; and

C. a sterically impeded phenol,

wherein the total weight of stabilizer composition is between 0.1 and 0.5 weight percent, based upon the combined total amount of polyester amide-forming starting materials and the weight ratio of the components A:B:C is within the following range: 0.5–10:1:1–40.

3,935,166

AROMATIC POLYESTER OF 2,6 AND/OR 2,7 NAPHTHALENE DICARBOXYLIC ACID

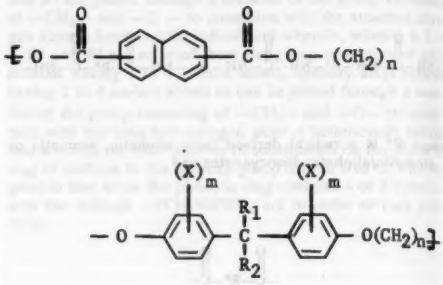
Tamaki Kanai, Machida; Takashi Yamagishi; Tetsuya Ohta, both of Sagamihara, and Hiroatsu Moriyama, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 368,288, June 8, 1973, abandoned. This application Aug. 22, 1974, Ser. No. 499,607

Int. Cl.² C08G 63/66

U.S. Cl. 260—47 C **6 Claims**

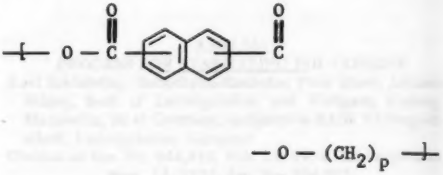
1. A linear aromatic polyester consisting essentially of, in the polymer molecule, about 50 to 100 mole % of a first repeating unit being represented by the formula



in which

R_1 and R_2 are the same or different and represent an alkyl group of 1–3 carbons, n is an integer of 1–6, X is a halogen atom and m is 0, 1 or 2;

and from 0 to about 50 mole % of a second repeating unit being represented by the formula



in which

p is an integer of 1–6;

with an intrinsic viscosity of 0.3 or more when measured at 35°C. by the use of orthochlorophenol as a solvent.

3,935,167

ACETYLENIC POLYMERS, TRIMERS THEREOF AND THE PRODUCTION THEREOF

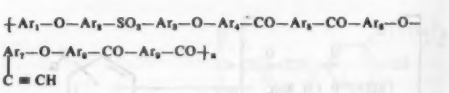
Carl S. Marvel, and Celeste Samyn, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Filed June 6, 1974, Ser. No. 476,901

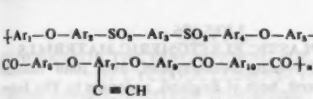
Int. Cl.² C08G 75/00

U.S. Cl. 260—49 **8 Claims**

1. A polymer having one of the general formulae



and



wherein Ar_1, Ar_2, Ar_3, Ar_4, Ar_5, Ar_6, Ar_8, Ar_9 and Ar_{10} are the same or different bivalent aromatic hydrocarbon radicals containing 6 to 10 carbon atoms, Ar_7 is a trivalent aromatic hydrocarbon radical containing 6 to 10 carbon atoms, and n is 30 to 120.

3,935,168
PROCESS FOR PREPARING POLYESTERS FROM TEREPHTHALIC ACID IN THE PRESENCE OF PHOSPHONIUM COMPOUNDS

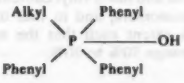
Robert Benson Rashbrook, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 203,858, Dec. 1, 1971, abandoned. This application Dec. 12, 1973, Ser. No. 424,011

Int. Cl.² C08G *63/38*

U.S. Cl. 260—75 P **4 Claims**

1. A process for the preparation of a fiber or film forming polyester or copolyester wherein terephthalic acid or a mixture of terephthalic acid with up to 25 molecules per 100 molecules of a second dicarboxylic acid is reacted with at least one glycol selected from the group consisting of $HO(CH_2)_nOH$ where n is greater than 1 and not greater than 10 and 1:4-hydroxymethylcyclohexane at elevated temperature and the resultant ester or mixture of esters is polycondensed in the presence of a polycondensation catalyst selected from the group consisting of soluble antimony compounds and soluble germanium compounds, at temperatures above said elevated temperature until a high molecular weight polyester or copolyester is formed, characterized in that during the reaction there is present a compound of the formula:



in amount not less than 0.001 percent by weight based on the terephthalic acid and not greater than about 0.5 percent by weight based on the terephthalic acid.

3,935,169
METHOD OF PREPARING POLYESTER POWDER

Robert Richard Reen, Stamford, Conn., assignor to ICI United States Inc., Wilmington, Del.

Continuation of Ser. No. 295,476, Oct. 2, 1972. This application June 28, 1974, Ser. No. 484,163

Int. Cl.² C08G *63/70*

U.S. Cl. 260—75 T **6 Claims**

1. A method of preparing a polyester powder from a synthetic polyester resin, selected from the group consisting of polyethylene terephthalate, polyethylene isophthalate, polyethylene orthophthalate, copolymers and mixtures thereof, said method comprising

a. dissolving the polyester resin in benzyl alcohol; and

b. precipitating the polyester powder by combining the solution with a diluent.

3,935,170
TRIVALENT ANTIMONY CATALYST

Otto Ernest Loeffler, Rahway, N.J., assignor to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 391,121, Aug. 24, 1973, Pat. No. 3,899,522. This application Feb. 3, 1975, Ser. No. 546,794

Int. Cl.² C08G *63/14*

U.S. Cl. 260—75 R **1 Claim**

1. In the process for preparing polyethylene terephthalate from terephthalic acid derivatives and ethylene glycol in the presence of an antimony catalyst, the improvement which comprises using as said catalyst, a trivalent antimony compound having the valences of antimony occupied by dianion radical of a 1,2-alkane diol and organic carboxylate anion radical, said carboxylate anion radical containing from 1 to 10 carbon atoms, wherein the mol ratio of antimony to dianion radical of 1,2-diol to organic carboxylate anion radical is 1:1:1., and wherein said dianion radical of a 1,2-alkane diol is selected from the group consisting of ethylene glycol dianion, 1,2-propane diol dianion, 3-chloro-1,2-propane diol dianion, 1,2-butane diol dianion, and mixtures thereof.

3,935,171
PROCESS FOR THE ANIONIC POLYMERIZATION OF PYRROLIDONE

Aldemaro Ciaperoni, and Andrea Mattiussi, both of Boliate, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed July 22, 1974, Ser. No. 490,742

Claims priority, application Italy, July 23, 1973, 26909/73

Int. Cl.² C08G *69/24*

U.S. Cl. 260—78 P **5 Claims**

1. A process for producing a fiber-forming polypyrrolidone by the anionic polymerization of pyrrolidone, which process comprises polymerizing said monomer in contact with a catalytic system composed essentially of an alkali pyrrolidonate as catalyst and, as activator of the catalyst, an alkali metal carbamate or ammonium carbamate.

3,935,172
REGULAR COPOLYAMIDES AS DESALINATION MEMBRANES

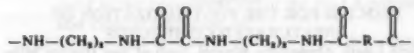
Otto F. Vogl, Amherst, Mass., and Donald R. Stevenson, Brunswick, Ohio, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 20, 1974, Ser. No. 471,513

Int. Cl.² C08G *69/26*

U.S. Cl. 260—78 R **8 Claims**

1. A film-forming copolyamide consisting essentially of the repeating units:



where R is selected from the group consisting of the isophthaloyl radical, the sebacyl radical and the pyridyl radical.

3,935,173
CURABLE COMPOSITIONS

Takahisa Ogasawara; Yorimasa Kobayashi; Kiyokazu Mizutani; Teruo Nakagawa; Noboru Hisanaga, and Hidemaro Tatemichi, all of Nagoya, Japan, assignors to Toagosei Chemical Industrial Co. Ltd., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,266

Claims priority, application Japan, Mar. 22, 1973, 48-32940

Int. Cl.² C08F *220/20*, *222/12*; C08G *63/52*

U.S. Cl. 260—78.5 E **26 Claims**

1. A curable composition comprising (A) an oligo(meth)acrylate having a (meth)acroyl group equivalent of not more than 1000 and being prepared by esterifying (1) a polyhydric

alcohol, (2) a polycarboxylic compound selected from the group consisting of a polycarboxylic acid and the anhydride thereof, said polyhydric alcohol and polycarboxylic compound not being a dihydric alcohol and dicarboxylic compound respectively at the same time, and (3) (meth)acrylic acid to produce the oligo(meth)acrylate and (B) a polyol poly(meth)acrylate prepared by esterifying a polyhydric alcohol and (meth)acrylic acid to produce the polyol poly(meth-)acrylate.

3,935,174

2-METHYLENE PROPANE PHOSPHONIC ACID ESTERS AND THEIR COPOLYMER WITH ACRYLONITRILE

Eugen Velker, Dormagen-Hackenbroich; Francis Bentz, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

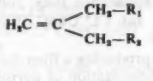
Division of Ser. No. 311,413, Dec. 1, 1972. This application Aug. 20, 1974, Ser. No. 499,068

Claims priority, application Germany, Dec. 3, 1971, 2160019

Int. Cl.² C08F *210/00, 220/42, 220/70, 220/02*

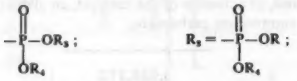
U.S. Cl. 260—80.71 9 Claims

1. An acrylonitrile copolymer comprising: 1. 60–99.9% by weight of acrylonitrile; 2. 0.1–40% by weight of 2-methylene propane phosphoric acid ester of the formula



wherein

R_1 = chloro, bromo, iodo, or



R_3 = hydrogen, ammonium, alkali metal, C_1-C_4-alkyl, or aryl;

H_4 hydrogen, C_1-C_4-alkyl, or aryl; and

3. the remainder being an ethylenically unsaturated comonomer copolymerizable with acrylonitrile;

said copolymer having a K-value of 60–120 as described by Fikentscher in Cellulosechemic 13, 58 (1932).

3,935,175

PROCESS FOR THE POLYMERIZATION OF UNSATURATED COMPOUNDS

Gabriele Lugli; Alessandro Mazzei, both of San Donato Milanese, and Gabriella Brandi, Milan, all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Nov. 19, 1973, Ser. No. 417,077

Int. Cl. C08d *1/14, 1/18, 1/20*

U.S. Cl. 260—82.1 12 Claims

1. Process for the polymerization and copolymerization of unsaturated compounds selected from the group consisting of olefins and diolefins wherein the polymerization reaction is carried out in the presence of a catalyst consisting of

a. an uranium compound selected from the group consisting of $U(OCH_3)_4$, $U(OCH_3)_3Cl$, $U(OC_4H_9)_4$, $U(OC_8H_{17})_4$, $U[N(C_2H_5)_2]_4$, $U[N(C_2H_5)_2]_3Br$, $U(OCH_3)_5$, $U(O\text{-}i\text{-}C_4H_9)_5$;

b. a reducing compound of a metal belonging to the 2nd or 3rd group of the periodic system selected from the hydrides, mixed hydrides and alkylderivatives thereof; and

c. a Lewis acid selected from $AlBr_3$, AlI_3, $AlCl_3.OEt_2$, $AlRCl_2$, BCl_3, $TiCl_4$ wherein R is a hydrocarbon radical.

3,935,176

THERMOSPLASTIC ELASTOMERIC MATERIALS

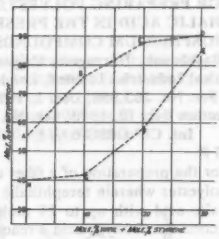
John Richard Hawkins, Southampton, and John Michael Locke, Lyndhurst, both of England, assignors to The International Synthetic Rubber Co., Ltd., England

Filed Sept. 8, 1971, Ser. No. 178,549

Claims priority, application United Kingdom, Sept. 14, 1970, 43767/70

Int. Cl. C08d *5/00, 3/08, 3/12*

U.S. Cl. 260—83.7 8 Claims



1. A thermoplastic elastomeric material comprising a hydrogenated copolymer of a conjugated diene characterized in that the copolymer before hydrogenation is a random copolymer, having a number average molecular weight of 100,000 to 500,000, of 93 to 98 mole % of butadiene or isoprene and 7 to 2 mole % of styrene and has a vinyl content of 0 to 12 mole % based on total monomers, and in that the copolymer is hydrogenated to an extent such that the mole percentage saturation is in the range 50% to 70%.

3,935,177

POLYMERISATION AND COPOLYMERISATION OF DIENES

Eberhard Müller, and Günter Marwede, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Nov. 6, 1974, Ser. No. 521,465

Claims priority, application Germany, Nov. 9, 1973, 2355941

Int. Cl.² C08D *1/20*

U.S. Cl. 260—84.7 9 Claims

1. A process for the homo- or copolymerisation of conjugated dienes, which comprises contacting at least one conjugated diene in an inert organic solvent with a catalytic amount of a catalyst consisting of an alkali metal amide of the formula:

wherein R and R′, which may be the same or different, are C_3 – C_{30} alkyl, C_3 – C_7 cycloalkyl, or C_6 – C_{10} aryl and Me is lithium, sodium or potassium, in the presence of a solvating agent for the catalyst selected from the group consisting of diethers, tertiary aliphatic diamines, triethylamine and tetrahydrofuran.

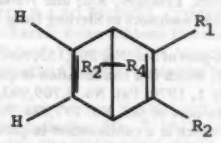
3,935,178

PROCESS FOR THE RING OPENING POLYMERISATION OF CYCLOOCTADIENE-(1-5)

Gunther Lehnert, Leverkusen-Waldsiedlung; Dieter Maertens, Leverkusen, and Manfred Zimmermann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed June 20, 1974, Ser. No. 481,312
Claims priority, application Germany, June 27, 1973, 2332564
Int. Cl.² C08F 4/06, 4/20, 4/22
U.S. Cl. 260—88.2 D 5 Claims

1. A process for the ring opening polymerization of cyclooctadiene-(1,5), said process comprising polymerizing said diene in the presence of 0.05 to 2 mmols for every 100 g. of said diene, of at least one halide of at least one metal selected from the group consisting of tungsten, molybdenum, tantalum and rhenium and in the presence of 0.1 to 10% by weight, based on the weight of said diene, of an activator of the formula



wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen and monovalent hydrocarbon.

3,935,179

CYCLOOLEFIN METATHESIS

Elert A. Ofstead, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 1, 1974, Ser. No. 456,912
Int. Cl.² C08F 4/22
U.S. Cl. 260—93.1 7 Claims

1. A cycloolefin metathesis process comprising polymerizing at least one unsaturated alicyclic compound selected from the group consisting of (1) unsaturated alicyclic compounds containing five carbon atoms in the ring and containing one double bond in the ring, (2) nonconjugated unsaturated alicyclic compounds containing at least seven carbon atoms in the ring and at least one double bond in the ring, and (3) polycyclic olefins and diolefins, by subjecting said alicyclic compounds or mixture thereof to polymerizations conditions in the presence of a catalyst system comprising (A) at least one transition metal salt selected from the group consisting of tungsten halides and tungsten oxyhalides, (B) at least one compound selected from the group consisting of dialkylaluminum halides, alkylaluminum sesquihalides and alkylaluminum dihalides, (C) at least one hydroxy compound of the general formula ROH wherein R is selected from the group consisting of alkyl and cycloalkyl and wherein R contains a nitrile substituted and (D) a hydroxy compound of the general formula R'OH wherein R' is selected from the group consisting of alkyl, cycloalkyl, alkoxyalkyl, haloalkyl and aryl, wherein the molar ratio of A:B:C:D lies within the range of 1:0.5–10:0.5–3:0.5–2.

3,935,180

POLYBUTADIENE AND PROCESS FOR PRODUCING SAME

Shotaro Sugiura; Tetsuro Matsuura; Haruo Ueno; Minoru Kono; Hideo Ishikawa, and Thunehiko Tokutomi, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Japan

Continuation-in-part of Ser. No. 210,597, Dec. 21, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,290
Int. Cl. C08d 3/08, 1/14
U.S. Cl. 260—94.2 R 16 Claims

1. A process for the production of polybutadiene consisting of 2–40% of the 1,2-cis structure, 60–98% of the cis-1,4-structure and not more than 1.5% of the trans-1,4-structure which comprises the two successive steps of:

first, polymerizing for a period of time ranging between a period of ten minutes and 10 hours, 1,3-butadiene in an inert organic solvent in the presence of a cis-1,4-polymerization catalyst consisting essentially of

a. a cobalt component selected from the group consisting of (a_1) a cobalt compound and (a_2) a material formed by electrochemically depositing metallic cobalt on metallic zinc, and

b. a halogen-containing organoaluminum compound represented by the formula

wherein R is an alkyl or cycloalkyl group having 1 to 6 carbon atoms or a phenyl group, X is a halogen atom and *n* is a positive number in the range of 1.5 to 2.0 thereby forming cis-1,4-polybutadiene, and

secondly, without deactivating the remaining cis-1,4-polymerization catalyst and with the addition or no addition of 1,3-butadiene and/or an inert organic solvent to the polymerization system, effecting the 1,2-polymerization of 1,3-butadiene, (A) in the case where the following component (*a'*) is not the same as component (*a*) of the cis-1,4-polymerization catalyst employed, by adding thereto, without deactivating the remaining cis-1,4-polymerization catalyst, a 1,2-polymerization catalyst comprising

a'. a cobalt component selected from the group consisting of (a'_1) a cobalt compound and (a'_2) a material formed by electrochemically depositing metallic cobalt on metallic zinc,

b'. an organoaluminum compound represented by the formula

$$AlR_nX_{3-n} \quad (2)$$

wherein R represents the group defined hereinbefore, and

c'. carbon disulfide, when the component (*a'*) is not the same as the component (*a*) of the cis-1,4-polymerization catalyst employed, or,

B. in the case where the component (*a'*) is the same as the component (*a*) of the cis-1,4-polymerization catalyst employed, by adding to the polymerization system, without deactivating the remaining cis-1,4-polymerization catalyst, either

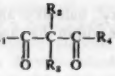
(B1) all the components of said 1,2-polymerization catalyst or

(B2) the components of said 1,2-polymerization catalyst except component (*a'*) when the component (*a'*) is the same as the component (*a*) of said cis-1,4-polymerization catalyst employed, the aforesaid 1,2-polymerization being conducted for a period of time varying between ten minutes and ten hours,

thereby forming the desired polybutadiene product, in which said cobalt compound of (a_1) and (a'_1) is a member selected from the group consisting of

i. a cobalt salt of a carboxylic acid having 6 to 10 carbon atoms,

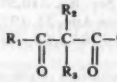
ii. a cobalt complex of a β-diketone represented by the formula:



(3)

wherein each of R_1 and R_4 is an alkyl group having 1 to 3 carbon atoms and each of R_2 and R_3 is a hydrogen atom or an alkyl group having 1 to 3 atoms,

iii. a cobalt complex of a β-keto acid ester represented by the formula



(4)

wherein R_1, R_2, R_3 and R_4 are as defined in preceding formula (3), and

(iv) a cobalt halide complex prepared from a cobalt halide represented by the formula CoXn wherein X is a halogen atom and *n* is 2 or 3 and a ligand capable of forming a complex in coordination with the cobalt halide, selected from the group consisting of tertiary amines, alcohols, tertiary phosphines, ketones and N,N-dialkylamides,

said cis-1,4-polymerization catalyst containing 0.002 to 50 millimoles of the cobalt compound (a_1) and 0.2 to 200 millimoles of the halogen-containing organoaluminum compound (*b*), per each mole of 1,3-butadiene, and the molar ratio (Al/Co) of the halogen-containing organoaluminum compound (*b*) to the cobalt compound (a_1) being 5 to 500, or containing 0.025 to 5 g of the material (a_2) formed by electrochemically depositing metallic cobalt on metallic zinc per 100 g of 1,3-butadiene and 0.1 to 5 times the weight of the material (a_2), of the halogen-containing organoaluminum compound (*b*), and

said 1,2-polymerization catalyst containing 0.001 to 10 millimoles of the cobalt compound (a'_1), 0.1 to 100 millimoles of the organoaluminum compound (*b'*) and 0.001 to 20 millimoles of carbon disulfide (*c'*), per each mole of 1,3-butadiene, and the molar ratio (Al/Co) of the organoaluminum compound (*b'*) to the cobalt compound (a'_1) being 5 to 500, or containing 0.05 to 10 g of the material (a'_2) formed by electrochemically depositing metallic cobalt on metallic zinc per 100 g of 1,3-butadiene, 0.1 to 5 times the weight of the material (a'_2), of the organoaluminum compound (*b'*) and 0.001 to 20 millimoles of carbon disulfide (*c'*) per mole of 1,3-butadiene.

3,935,181

PROCESS FOR CHLORINATING ETHYLENE POLYMERS

Lowhardt A. A. Schoen, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 27, 1974, Ser. No. 500,942

Claims priority, application Netherlands, Aug. 28, 1973, 7311780

Int. Cl. C08f *27/03*

U.S. Cl. 260—94.9 H **15 Claims**

1. Process for chlorinating a solid, finely divided ethylene polymer to produce statistical or hybridical chloropolyethylene, said process comprising

a. mixing said polymer with 10 to 100% by weight of water, based on the weight of ethylene polymer, and

b. chlorinating the polymer with gaseous chlorine at a temperature which is below the ethylene polymer decomposition temperature and above the crystalline melting point of the ethylene polymer during at least about 70% of the chlorination period and at a pressure such that the boiling point of water at said pressure is at least equal to the said chlorination temperature while maintaining the amount of water in the ethylene polymer at a level of at least 10% by weight, based on the weight of starting ethylene polymer, until the chlorination has proceeded to a polymer chlorine content of at least 15% by weight and maintaining the water substantially uniformly distributed in the polymer.

3,935,182

WATER-SOLUBLE QUATERNARY AMMONIUM HETEROCYCLIC AZO DYESTUFFS

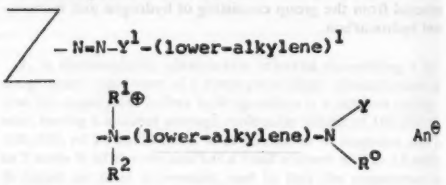
Patrick J. Jefferies, Erlanger, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 201,153, Nov. 22, 1971, Pat. No. 3,784,599, which is a continuation-in-part of Ser. No. 51,676, July 1, 1970, Pat. No. 3,709,903, which is a continuation-in-part of Ser. No. 777,884, Nov. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,868, May 23, 1966, abandoned. This application Feb. 14, 1973, Ser. No. 332,511

Int. Cl.[2] C09B *29/34*, *29/36*, *29/38*; D06P *1/08*

U.S. Cl. 260—155 **18 Claims**

1. A compound of the formula



wherein:

R^o is hydrogen, lower-alkyl or hydroxy-lower-alkyl;

R^1 is lower-alkyl, lower-alkenyl or hydroxy-lower-alkyl;

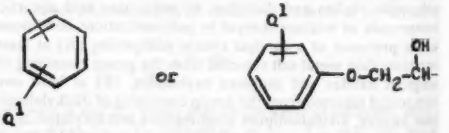
R^2 is lower-alkyl, lower-alkenyl, hydroxy-lower-alkyl or -(lower-alkylene)-NR^oY; or R^1 and R^2 together with the nitrogen atom are pyrrolidino, piperidino or 4-lower-alkanoyl piperazino;

Y is hydrogen or

wherein R is hydrogen, lower-alkyl, lower-alkenyl, phenyl or phenyl-lower-alkyl;

An is an anion;

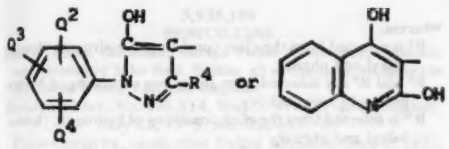
Y^1 is a divalent radical of the formula



in which

Q^1 is hydrogen, lower-alkyl, lower-alkoxy or halogen; and

Z is an azoic coupling radical of the formula



in which

Q^3, Q^3 and Q^4 are each hydrogen, lower-alkyl, lower-alkoxy, hydroxy, nitro, amino, carbo-lower-alkoxy, carboxamido, sulphamyl or halogen; and R^4 is lower-alkyl, lower-alkoxy, carboxamido or carbo-lower-alkoxy.

3,935,183

INDAZOLE-AZO PHENYL COMPOUNDS

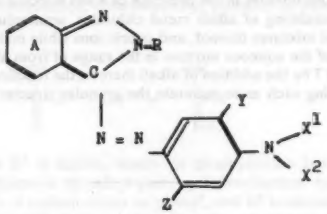
Thomas Douglas Baron; Brian Ribbons Fishwick; John Lindley Leng, and Michael Yelland, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 105,100, Jan. 8, 1971, abandoned. This application May 7, 1973, Ser. No. 357,577

Int. Cl.[2] C09B *29/08, 29/26*

U.S. Cl. 260—162 **1 Claim**

1. A water-insoluble azo dyestuff of the formula:



wherein R is lower alkyl; the ring A is unsubstituted or is substituted by chlorine, bromine or nitro; Y is hydrogen, lower alkyl or lower alkoxy; Z is hydrogen, lower alkyl, lower alkoxy, chlorine or a group of the formula —NHCOR[1] wherein R^1 is lower alkyl; and X^1 and X^2 are independently selected from hydrogen, lower alkyl, hydroxy lower alkyl, lower alkylcarbonyl lower alkyl, cyano lower alkyl, lower alkoxycarbonyl lower alkyl, lower alkoxy lower alkyl, lower alkylcarbonyloxy lower alkyl, lower alkoxy lower alkoxycarbonyl lower alkyl, cyano lower alkoxy lower alkyl, chloro lower alkyl, phenoxy lower alkyl, phenyl, lower alkylcarbonylamino lower alkyl, cyano lower alkoxycarbonyl lower alkyl and lower alkylcarbonyloxy lower alkoxy carbonyl lower alkyl.

3,935,184

SYNTHETIC POLYOXIN TYPE NUCLEOSIDES

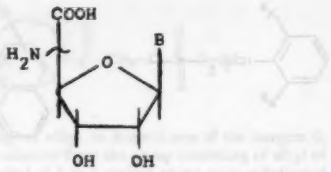
Gordon H. Jones, Palo Alto; John G. Moffatt, Los Altos, and Michael D. Edge, Mountain View, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 22, 1972, Ser. No. 228,366

Int. Cl.[2] C07H *19/16, 19/18;* **C08B** *37/00*

U.S. Cl. 260—211.5 R **16 Claims**

1. A compound having the formula:



wherein the wavy line indicates either the 5'-D-allo or the 5'-L-talo epimer and B is a purine or pyrimidine radical selected from the group consisting of 5-hydroxyuracil-1-yl, 5-hydroxycytosin-1-yl, 5-azauracil-1-yl, 5-aza-cytosin-1-yl, 2-thiouracil-1-yl, 2-thiocytosin-1-yl, 4-thiouracil-1-yl, 2-amino-6-chloropurin-9-yl, 2-amino-6-mercaptopurin-9-yl, 6-methylthioguanin-9-yl, 6-chloropurin-9-yl, 2,6-dichloropurin-9-yl, 6-mercaptopurin-9-yl, 6-methylthiopurin-9-yl, and 6-hydroxylaminopurin-9-yl; and pharmaceutically acceptable salts thereof.

3,935,185

POLYNUCLEOTIDES OF POLY(5-HYDROXYCYTIDYLIC ACIDS)

David Wesley Hutchinson, Leamington Spa, and Michael Anthony William Eaton, Aylesbury, both of England, assignors to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 28, 1974, Ser. No. 455,877

Claims priority, application United Kingdom, Apr. 2, 1973, 15671/73

Int. Cl.[2] C07H *19/10*

U.S. Cl. 260—211.5 R **2 Claims**

1. Poly(5-hydroxycytidylic acids) containing greater than ten and up to 200 5-hydroxycytidine residues, inclusive.

3,935,186

INTERMEDIATES FOR PRODUCING SEMI-SYNTHETIC PENICILLINS AND CEPHALOSPORINS AND METHODS OF PRODUCTION

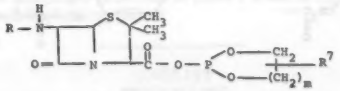
John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 197,142, Nov. 9, 1971, Pat. No. 3,859,298. This application July 5, 1973, Ser. No. 376,788

Int. Cl.[2] C07D *501/02, 499/04*

U.S. Cl. 260—239.1 **9 Claims**

1. A compound selected from the group consisting of those having the following formula and the acid addition salts thereof:



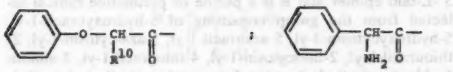
wherein:

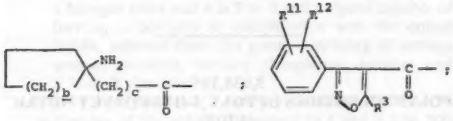
R is an organic acyl radical derived from an organic carboxylic acid or a reactive derivative thereof;

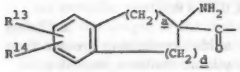
R^7 is selected from the class consisting of hydrogen and lower alkyl and

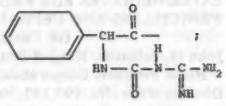
m is a whole number from 1 to 6;

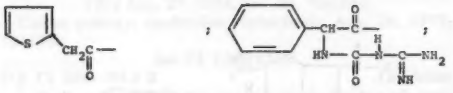
and wherein said organic acyl defined by R is selected from the group consisting of

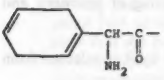












wherein:

R^8 is selected from the class consisting of hydrogen, (lower-)alkyl and phenyl;

R^8 and R^9 are selected from the group consisting of hydrogen and (lower)alkoxy;

R^{10} is selected from the class consisting of hydrogen, (lower-)alkyl and phenyl;

R^{11} and R^{12} are selected from the class consisting of hydrogen and halogen; R^{13} and R^{14} are selected from the class consisting of hydrogen, halogen, (lower)alkyl, (lower)alkoxy, phenyl and phenoxy; *a* is an interger from 0 to 1; *b* is an interger from 0 through 5; *c* is an interger from 0 through 2; *d* is an interger from 1 through 3, with the proviso that when *a* is 0, *d* is greater than 1, and when *a* is 1, *d* is less than 3.

3,935,187

PROCESS FOR DEPOLYMERIZING AMYLACEOUS POLYMERS

Edwin L. Speakman, Clinton, Iowa, assignor to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 408,030, Oct. 19, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,609

Int. Cl.² C08B *33/00, 31/00*

U.S. Cl. 260—233.3 R **8 Claims**

1. A process for partially depolymerizing granular starch comprising reacting granular starch with hydrogen peroxide in an aqueous mixture in the presence of a salt selected from the group consisting of alkali metal chlorides, ammonium chlorides and mixtures thereof, and cupric ions while maintaining the pH of the aqueous mixture in the range of from about 5.5 to about 7 by the addition of alkali thereto, the reaction conditions being such as to maintain the granular structure of the starch.

3,935,188

REMOVAL OF HYDROGEN CYANIDE FROM ACIDIC GASES

Heinz Karwat, Pullach, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 10, 1973, Ser. No. 423,397

Claims priority, application Germany, Dec. 8, 1972, 2260248

Int. Cl.² C01C *3/00*

U.S. Cl. 423—236 **18 Claims**

1. In a process for the removal of hydrogen cyanide from gases containing at least one other acidic component selected from the group consisting of hydrogen sulfide, carbonyl sulfide and mixtures thereof comprising scrubbing said hydrogen cyanide and said at least one other acidic component from the gases with a physical scrubbing agent, regenerating resultant loaded scrubbing agent, and recycling resultant regenerated scrubbing agent to the scrubbing step,

the improvement wherein as part of said regenerating, the resultant loaded physical scrubbing agent containing said hydrogen cyanide is mixed with an aqueous alkali metal or alkaline earth hydroxide solution, and the thus-formed cyanide salt solution is thermally decomposed into ammonia and formate according to the following reaction:

$$Me(CN)_x + 2x\,H_2O = Me(HCOO)_x + xNH_3$$

wherein

Me is an alkali or alkaline earth metal,

x is the valence of Me.

3,935,189
PENICILLINS

Harry Ferres, Horsham; Adrian Victor Kemmenoe, Westcott, and Desmond John Best, Sutton, all of England, assignors to Beecham Group Limited, England

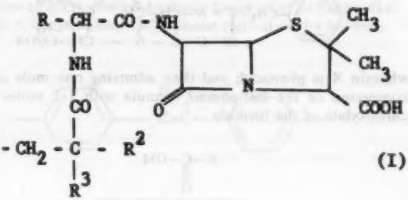
Division of Ser. No. 466,814, May 3, 1974. This application May 15, 1975, Ser. No. 577,715

Claims priority, application United Kingdom, May 4, 1973, 21203/73

Int. Cl.² C07D 499/44

U.S. Cl. 260—239.1 9 Claims

1. A penicillin of formula (I):



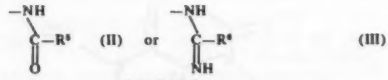
(I)

wherein

R is phenyl, hydroxyphenyl, halophenyl, nitrophenyl, alkoxyphenyl having 1–3 carbon atoms in the alkoxy part, aminophenyl, 2- or 3-thienyl, cycloalkyl having 3–7 carbon atoms in the cyclo part, or alkyl having 1–4 carbon atoms;

R^1 is phenyl, benzyl, 3-hydroxyphenyl, 4-hydroxyphenyl, 4-nitrophenyl, 4-chlorophenyl, 4-fluorophenyl, 4-methoxyphenyl, 4-aminophenyl, phenoxy or benzyloxy;

R^2 is



(II) or (III)

in which R^5 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part, cyclohexylamino, hydrogen, alkyl of 1–4 carbon atoms or phenyl, and R^6 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part or cyclohexylamino;

R^3 is hydrogen or alkyl or 1–3 carbon atoms; or a pharmaceutically acceptable salt or a pharmaceutically acceptable hydroylzable ester which converts to the free acid form in vivo.

3,935,190
SULFITES OF ALIPHATIC GLYCOLIC AMIDES

Adolf Fischer, Mutterstadt; Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

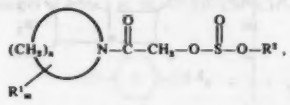
Filed June 20, 1974, Ser. No. 481,216

Claims priority, application Germany, June 30, 1973, 2333477

Int. Cl.² C07D 295/16, 223/04

U.S. Cl. 260—239 B 5 Claims

1. A sulfite of an aliphatic glycolic amide of the formula



where R^1 is methyl or ethyl, m denotes one of the integers 0, 1, 2 and 3, R^2 is selected from the group consisting of alkyl of 1 to 6 carbons, alkyl of 1 to 6 carbon atoms none-substituted by halogen; cyclopropyl; cyclohexyl; allyl; methallyl; propargyl; and butyn-1-yl-3, and *n* denotes one of the integers 3, 4, 5 and 6.

3,935,191
AMINOALKYL ETHERS OF 2,2′- AND 3,3′-DIHYDROXYBENZIL

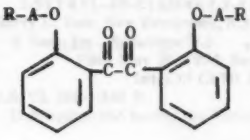
Gerhard R. Wendt, Havertown, and Michael W. Winkley, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,354

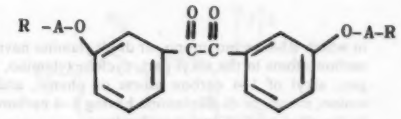
Int. Cl.² C07D 295/08

U.S. Cl. 260—239 B 13 Claims

1. A symmetrical compound of the formula:

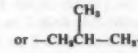


and

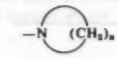


wherein A is a divalent aliphatic hydrocarbon radical of the formula

$-CH_2CH_2-$, $-CH_2CH_2CH_2-$,



and R is an amino group of the formula



wherein *n* is the number 4, 5, or 6; and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

13. A compound as defined in claim 1 which is 3,3′-bis-[2-(1-pyrrolidinyl)ethoxy]benzil.

3,935,192
PENICILLINS

Harry Ferres, Horsham; Adrian Victor Kemmenoe, Westcott, and Desmond John Best, Sutton, all of England, assignors to Beecham Group Limited, Great Britain

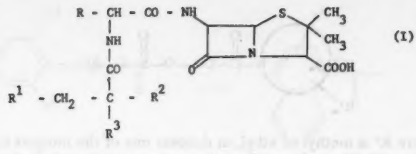
Division of Ser. No. 466,814, May 3, 1974. This application May 16, 1975, Ser. No. 578,262

Claims priority, application United Kingdom, May 4, 1973, 21203/73

Int. Cl.² C07D 449/44

U.S. Cl. 260—239.1 8 Claims

1. A penicillin of formula (I):



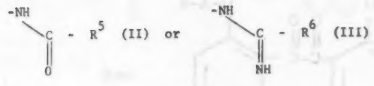
(I)

wherein

R is phenyl, hydroxyphenyl, halophenyl, nitrophenyl, alkoxyphenyl having 1–3 carbon atoms in the alkoxy part, aminophenyl, 2- or 3-thienyl, cycloalkyl having 3–7 carbon atoms in the cyclo part, cycloalkenyl having 5–7 carbon atoms in the cyclo part, or alkyl having 1–4 carbon atoms;

R^1 is acetoxy;

R^2 is



(II) or (III)

in which R^5 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part, cyclohexylamino, hydrogen, alkyl of 1–4 carbon atoms or phenyl, and R^6 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part or cyclohexylamino;

R^3 is hydrogen or alkyl of 1–3 carbon atoms; or a pharmaceutically acceptable salt or a pharmaceutically acceptable hydrolyzable ester which converts to the free acid form in vivo.

3,935,193

DIACYL PENICILLINS AND METHODS FOR THEIR PRODUCTION

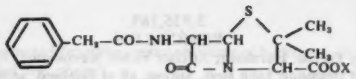
Jinnosuke Abe, Shizuoka; Tetsuo Watanabe, Kanagawa; Teruo Take; Kentaro Fujimoto; Tadashiro Fujii, and Kazuyoshi Nishile, all of Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 29, 1970, Ser. No. 102,556

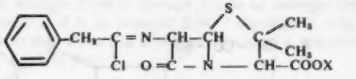
Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **4 Claims**

1. A process for the production of a diacyl penicillin, comprising admixing 1 mole of a benzyl penicillin ester of the formula



wherein X is phenacyl, with 1–2 moles of a chlorinating agent selected from the group consisting of PCl_5, $POCl_3$, $COCl_2$ and $SOCl_2$, and 1–5 moles of a tertiary organic amine selected from the group consisting of pyridine, quinoline and dimethylaniline, at a temperature of −20° to 25°C., to obtain an imide chloride group-incorporated compound of the formula



wherein X is phenacyl; and then admixing one mole of the compound of the last-named formula with 1-2 moles of a carboxylate of the formula

wherein M is a metal atom selected from the group consisting of potassium, sodium, lithium and silver, and R is a member selected from the group consisting of 1-(2′,6′-dichlorophenyl)4-methylpyrazole-5-carbonyl, 1-(p-chlorophenyl)-3-methylpyrazole5-carbonyl, and 1-phenyl-4-methylpyrazole-5-carbonyl, at a temperature of 20° to 60°C.

3,935,194

SEPARATION OF HECOGENIN-TIGOGENIN MIXTURES

Bjarte Löken, Milan, Italy, assignor to Omni Research Incorporated, San German, P.R.

Filed Jan. 22, 1974, Ser. No. 435,465

Int. Cl.² C07J *17/00*

U.S. Cl. 260—239.55 A **5 Claims**

1. A method for separating a hecogenin-tigogenin mixture predominant in hecogenin which comprises acetylating the mixed genins, then dissolving the resulting mixed acetates in a non-polar solvent, and thereafter crystallizing out a relatively pure hecogenin acetate, the tigogenin acetate remaining in solution in the mother liquor.

3,935,195

4,4′-STILBENEBIS-PYRIDOOXAZOLES AND RELATED OPTICAL BRIGHTENERS AND POLYMERIC COMPOSITIONS BRIGHTENED THEREBY

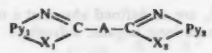
Nathan N. Crounse, Cincinnati, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 820,005, April 28, 1969. This application July 14, 1971, Ser. No. 162,620

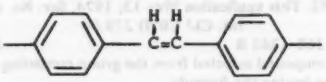
Int. Cl.² C07D *221/00*

U.S. Cl. 260—240 CA **7 Claims**

1. A fluorescent compound of the formula



wherein Py_1 and Py_2 are each a bivalent heterocyclic nucleus of the pyridine class in which the open bonds are on vicinal ring carbon atoms of said nucleus wherein each of the pyrido rings is otherwise unsubstituted or further substituted by a member of the class consisting of halogen, lower alkoxy and lower alkyl; X_1 and X_2 are each a member of the class consisting of O, S and NR, wherein R is H, lower alkyl, hydroxy-lower alkyl, hydroxyoxaalkyl of 3 to 15 carbon atoms, phenyl-lower alkyl, cyano-lower alkyl, carboxy-lower alkyl, carbo-lower alkoxy-lower alkyl, phenyl-hydroxy-lower alkyl or lower alkenyl; and A is a bivalent 4,4′-stilbene radical of the formula



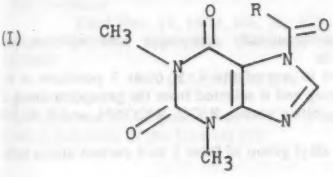
3,935,196

USEFUL PRO-DRUG FORMS OF THEOPHYLLINE

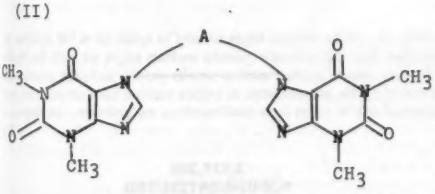
Takeru Higuchi; Nicolae S. Bodor, and Yu-Neng Kuo, all of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Apr. 22, 1974, Ser. No. 463,092
Int. Cl.² C07D *473/08*
U.S. Cl. 260—240 J 21 Claims

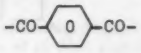
1. A pro-drug of theophylline having the formula



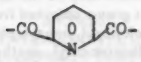
or



wherein R represents a member selected from the group consisting of straight or branched C_4–C_{20} alkyl, straight or branched C_4–C_{20} alkenyl, substituted phenyl or substituted or unsubstituted naphthyl whose substituents are selected from the group consisting of hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, acyloxy derived from an alkanoic acid of up to 4 carbon atoms chlorine, bromine, and iodine, and 2-,3-,4-pyridyl or quinoline and wherein A represents a member selected from the group consisting of —CO—, —CO—$(CH_2)_n$—CO— wherein *n* represents an integer of from 1 to 16, —CO—CH=CH— CO-(cis or trans),



and



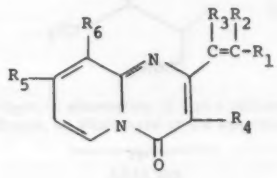
3,935,197

2-STYRYL-4H-PYRIDO(1,2-A)PYRIMIDIN-4-ONES

Harry L. Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 16, 1975, Ser. No. 578,237
Int. Cl.² C07D *239/70*
U.S. Cl. 260—240 D 10 Claims

1. A compound having the formula



wherein R_1 is phenyl, phenyl substituted with 1,2 or 3 of the same or different alkyl, alkoxy or halogen groups, phenyl substituted with 1 or 2 dialkylamidosulfonyl groups, or phenyl substituted with 1 or 2 trifluoromethyl groups; R_2 and R_3 are the same or different and are hydrogen or alkyl; and R_4, R_5 and R_6 are the same or different and are hydrogen or methyl; and wherein the terms alkyl and alkoxy refer to non-tertiary groups having 1 to 4 carbon atoms.

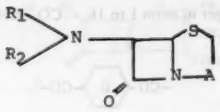
3,935,198

PROCESS FOR THE PREPARATION OF THE CEPHALOSPORANIC ACID DERIVATIVE

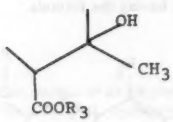
Masuo Murakami; Kozo Takahashi, both of Tokyo; Ichiro Isaka, Hoya; Teruaki Ozasa, Ageo, and Teruya Kashiwagi, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1973, Ser. No. 426,108
Claims priority, application Japan, Dec. 28, 1972, 48-2755
Int. Cl.² C07D *501/10*
U.S. Cl. 260—243 C 7 Claims

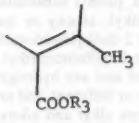
1. A process for the preparation of a cephalosporanic acid derivative represented by the formula



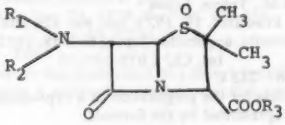
wherein R_1 and R_2, which may be the same or different, each represents a univalent group, selected from the group consisting of lower alkyl, cyclohexyl, benzyl, phenethyl, 2-furylethyl, 2-pyridylmethyl, trifluoromethyl, methoxymethyl, phenoxyethyl, benzylthioethyl, trichloromethyl, phenyl, naphthyl, quinolyl, pyridyl, piperidyl, furyl, tolyl, p-nitrophenyl, phenylacetyl, cyclohexylacetyl, 2-thienylacetyl, 2-furylacetyl, cyclopentylcarbonyl, α-phenoxyacetyl, benzoyl, thiobenzoyl, said R_1 and R_2 may be combined to form a divalent group selected from the group consisting of salicylidene, benzylidene, oxomethylidene, α-chloro-phenethylidene, ethylidene, α-imino-phenethyl, piperidinomethyl-idene, 1-phenyl-1-dimethylamino methylidene, 1-propenylidene,pentamethylene, 1-oxopentamethylene, tetramethylene, ethylene-dicarbonyl, phthaloyl, 3-phenyl-1,1,2-trimethyl-4-oxo-2-azatetramethylene, 1,1-dimethyl-3-phenyl-2-nitroso-4-oxo-2-azatetramethylene, 1,4-dioxo-2-butene-1,4-diyl, and o-phenylenedithiocarbonyl, and A represents a divalent group represented by the formulae



or



wherein R_3 represents a hydrogen atom, a methyl group, an ethyl group, a tert-butyl group, a 2,2,2-trichloroethyl group, a triphenylmethyl group, a bis(p-methoxyphenyl)methyl group a methoxybenzyl group, a benzhydryl group, a 3,5-di-tert-butyl-4-hydroxybenzyl group, a phthalimidomethyl group, a p-toluenesulfonylethyl group, or a halogen-substituted benzyl group which consists essentially of heating the penicillin sulfoxide derivative represented by the formula



wherein R_1 and R_2 are as defined above at a temperature up to about 180°C in an inert organic solvent.

3,935,199

IMINOMETHYLINDOLINES

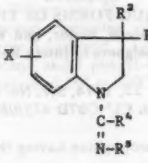
Yao Hua Wu, and Walter G. Lobeck, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 253,672, May 8, 1972, Pat. No. 3,823,136, which is a division of Ser. No. 862,915, Oct. 1, 1969, Pat. No. 3,679,692. This application May 13, 1974, Ser. No. 469,201

Int. Cl.² C07D *279.04*

U.S. Cl. 260—243 R 4 Claims

1. A compound selected from the group consisting of indoline bases having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein

X is located in any of the 4, 5, 6, or 7 positions of the indoline ring and is selected from the group consisting of hydrogen, nitro, amino, R^1CO, R^1CONH, and R_1SO_2NH wherein

R^1 is lower alkyl group of from 1 to 4 carbon atoms inclusive,

R^2 and R^3 are independently selected from the group consisting of hydrogen and lower alkyl of from 1 to 3 carbon atoms inclusive, and

R^4 and R^5 are joined to form in combination with the atoms to which they are attached a 5,6-dihydro-3-(2H-thiazinyl), 2-imidazolin-2-yl, or 3H-indol-2-yl group.

3,935,200

N,N-DISUBSTITUTED 2,1,3-BENZOTHIADIAZIN-(4)-ONE-2,2-DIOXIDE

Adolf Fischer, Mutterstadt; Gerhard Hamprecht, Mannheim, and Rolf Huber, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

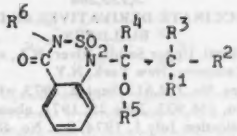
Filed Oct. 18, 1974, Ser. No. 516,072

Claims priority, application Germany, Nov. 3, 1973, 2355113

Int. Cl.³ C07D *285/16*

U.S. Cl. 260—243 R 9 Claims

1. A substituted 2,1,3-benzothiadiazin-(4)-one-2,2-dioxide of the formula



I,

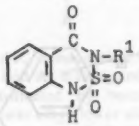
where R^1, R^2, R^3 and R^4 are hydrogen or lower alkyl, R^5 is an alkyl radical of 1 to 20 carbon atoms, R^1 and R^5 may also be combined to form a chain containing 2 or 3 methylene radicals, and R^6 is an alkyl radical of 1 to 10 carbon atoms or a lower alkyl substituted by fluoro, chloro or cyclohexyl.

3,935,201
PRODUCTION OF 2,1,3-BENZOTHIADIAZIN-4-ONE-2,2-IOXIDES

Dietrich Mangold, Neckargemuend; Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

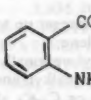
Filed Nov. 11, 1974, Ser. No. 522,630
Claims priority, application Germany, Nov. 15, 1973, 2357063
Int. Cl.² C07D 285/16
U.S. Cl. 260—243 R 7 Claims

1. A process for the production of a 2,1,3-benzothiadiazin-4-one-2,2-dioxide of the formula (I):



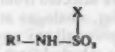
(I)

in which R^1 is an alkyl of one to eight carbon atoms, or cycloalkyl of five to eight carbon atoms, wherein the said radicals may bear alkyl or alkoxy of one to four carbon atoms, carbalkoxy of two to four carbon atoms as substituents, which process comprises: reacting an anthranilinic acid ester of the formula (II):



(II)

in which R^2 is an alkyl of one to eight carbon atoms, cycloalkyl of five to eight carbon atoms, aralkyl of seven to twelve carbon atoms or phenyl, wherein said radicals may bear alkyl or alkoxy of one to four carbon atoms, or carbalkoxy of two to four carbon atoms as substituents, with a sulfamyl halide of the formula (III):



(III)

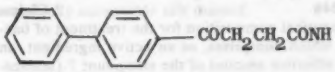
n which R^1 has the above meaning and X is bromine or chlorine in the presence of an inert organic solvent and a basic compound selected from the group comprising tertiary amines, alkaline earth metal compounds and alkali metal compounds at a temperature of from 20° to 100°C.

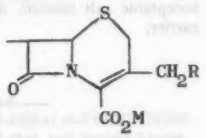
3,935,202
3-(4-BIPHENYLYLCARBONYL)PROPIONAMIDO CEPHALOSPORIN DERIVATIVES

Peter H. L. Wei, Springfield, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,017
Int. Cl.² C07D 499/44, 501/20
U.S. Cl. 260—243 C 3 Claims

1. A compound of the formula





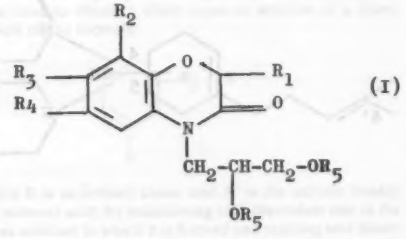
in which
R is hydrogen or alkanoyloxy of 2 to 6 carbon atoms, and
M is hydrogen, an alkali metal or the ammonium cation.

3,935,203
DERIVATIVES OF 3-OXO-2,3-DIHYDRO-1,4-BENZOXAZINE

Germaine Thuillier, Paris, and Jacqueline Laforest, Vincennes, both of France, assignors to CERPHA, Arceuil, France

Filed Aug. 2, 1973, Ser. No. 384,924
Claims priority, application France, Aug. 3, 1972, 72.28095
Int. Cl.² C07D 265/28
U.S. Cl. 260—244 R 17 Claims

1. Derivative of 3-oxo-2,3-dihydro-1,4-benzoxazine corresponding to the formula (I)



(I)

in which:
R_1 is selected from the group consisting of the hydrogen atom and a lower alkyl group; R_2, R_3 and R_4, which are

identical or different, are selected from the group consisting of the hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, a lower alkoxy group and R_4 may be an allyl group; and R_5 is selected from the group consisting of the hydrogen atom and an acetyl group.

3,935,204

CEPHALOSPORIN AND PHARMACEUTICAL PREPARATIONS CONTAINING THE SAME

Sven Erik Dahlen; Bertil Ake Ekström; Ödön Kálmán József Kovács, and Berndt Olof Harald Sjoberg, all of Sodertalje, Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Mar. 13, 1973, Ser. No. 340,673

Claims priority, application United Kingdom, Mar. 13, 1972, 11690/72

Int. Cl.² A61K *31/51*

U.S. Cl. 424—246 **2 Claims**

1. A pharmaceutical composition for the treatment of bacterial infection which comprises, as an active ingredient, an anti-bacterially effective amount of the compound 7-(tetrazolyl-acetamido)-3-[(5-methylthiodiazolyl)-thiomethyl] cephem, ethoxycarbonyloxymethyl ester, or a therapeutically acceptable salt thereof, in a pharmaceutically acceptable carrier;

3,935,205

DIMORPHOLINOMETHYL-(4-METHYL-3-PENTENYL)-CYCLOHEXENENES

Paul Albert Ochsner, Geneva, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

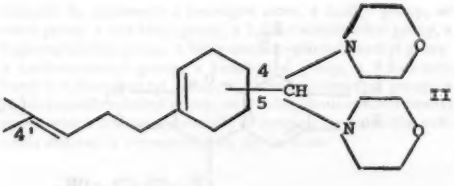
Filed Sept. 3, 1974, Ser. No. 502,464

Claims priority, application Switzerland, Sept. 21, 1973, 13606/73

Int. Cl.² C07D *295/08*

U.S. Cl. 260—246 B **1 Claim**

1. A compound of the formula:



II

wherein the dimorpholinomethyl residue is present in the 4- or 5-position,
or mixtures of the 4- and 5-position isomers of the formula II.

3,935,206

SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

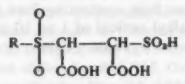
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application July 1, 1974, Ser. No. 484,917

Int. Cl.² C07C *143/00*; C07D *295/00*

U.S. Cl. 260—247.1 E **1 Claim**

1. An α-alkylsulfonyl-β-sulfosuccinic acid having the general formula:



or the alkali metal, ammonium, monoethanolammonium, diethanolammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium and N-ethylmonoethanolammonium salt thereof wherein R is an alkyl containing 1–30 carbon atoms.

3,935,207

CONJUGATE ADDITION

Maurice W. Gittos, Slough, and David Anthony Amey, Luton, both of England, assignors to Aspro-Nicholas Limited, Slough, England

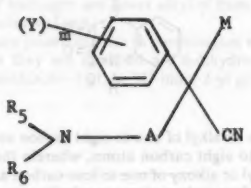
Filed Dec. 18, 1973, Ser. No. 425,875

Claims priority, application United Kingdom, Dec. 28, 1972, 59762/72

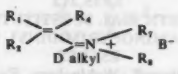
Int. Cl.² C07D *295/00*

U.S. Cl. 260—247.5 R **11 Claims**

1. A method of conjugate covalent addition which comprises treating a donor compound with an acceptor compound, said donor having the formula



wherein y represents C_1–C_4 alkyl optionally substituted by hydroxy or by C_1–C_4 alkoxy, hydroxy, C_1–C_4 alkoxy, halogen or trifluoromethyl;
m represents zero or an integer up to 5;
A represents C_1–C_8 alkylene;
R_5 represents C_1–C_4 alkyl optionally substituted by C_5–C_6 cycloalkyl or C_5–C_6 cycloalkyl; and
R_6 represents hydrogen or C_1–C_4 alkyl optionally substituted by phenyl; or
R_5 and R_6 together represent an alkylene radical optionally interrupted by oxygen or nitrogen and which together with the amino nitrogen atom constitutes a saturated five or six-membered heterocyclic ring; and
M represents a cation;
and said acceptor having the formula



wherein R_1 and R_2 independently represent hydrogen or C_1–C_4 alkyl and R_4 represents hydrogen, C_1–C_4 alkyl or C_2–C_5 alkoxycarbonyl provided that at least one of R_1, R_2 and R_4 represents alkyl or

R_1 together with R_2 or R_4 represents an alkylene radical which together with their adjacent carbon atom(s) forms a carbocyclic ring of 3 to 8 carbon atoms and R_4 or R_2 respectively is as defined above, or

R_1 together with R_4 represents a third valency bond joining their immediately adjacent carbon atoms and R_2 represents C_1–C_4 alkyl;

R_7 and R_8 represent the same or different alkyl radicals or together represent a saturated alkylene radical optionally substituted by oxygen or nitrogen which with the adjacent nitrogen atom forms a heterocyclic ring;

D represents Q or S and

B^- represents a non-nucleophilic anion.

3,935,208
TRIAZINYL VAT DYESTUFFS

Hans Altermatt, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

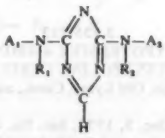
Filed Jan. 21, 1974, Ser. No. 435,062

Claims priority, application Switzerland, Jan. 30, 1973, 1327/73

Int. Cl.² C07D 251/48

U.S. Cl. 260—249 3 Claims

1. A vat dyestuff of the formula



wherein each of R_1 and R_2 is independently hydrogen or lower alkyl, and each of A_1 and A_2 is independently anthraquinone unsubstituted or substituted by benzoylamino, halobenzoylamino, halogen, lower alkyl, lower alkoxy, lower alkanoyl, amino, phenylmercapto, or is phthaloylacridone.

3,935,209
5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

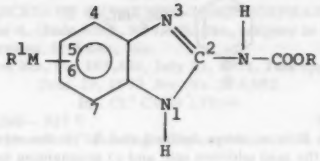
Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 340,581, March 12, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,222

Int. Cl.² C07D 235/32

U.S. Cl. 260—250 BN 22 Claims

1. A compound selected from the group of compounds represented by the formula:



where R is a lower alkyl group having 1 to 4 carbon atoms; R^1 is selected from the group consisting of thiazolyl, pyridyl, imidazolyl, pyrimidinyl, thienyl, pyridazinyl, pyrazinyl, pyrrolyl, pyrazolyl, oxazolyl, furyl, isothiazolyl, isoxazolyl, thiadiazolyl, and triazolyl, and M is O, S, or

the R^1 M-substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

3,935,210
PREPARATION OF 1-ARYL-4,5-DIHALO-PYRIDAZONE-6

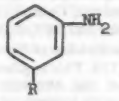
William J. Houlihan, Mountain Lakes, and Jerome Linder, Westfield, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 167,481, July 29, 1971, abandoned. This application May 20, 1974, Ser. No. 471,462

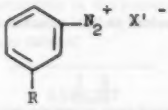
Int. Cl.² C07D 237/12

U.S. Cl. 260—250 A 10 Claims

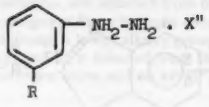
1. A single aqueous phase process for preparation of a 1-aryl-4,5-dihalopyridazone-6 comprising the steps of: a) reacting a compound of the formula:



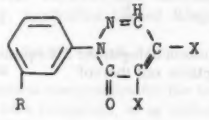
in which R is hydrogen or trifluoromethyl with nitrous acid in a dilute aqueous solution in the presence of a mineral acid selected from the group consisting of hydrochloric acid and sulfuric acid to obtain a dilute aqueous solution of a diazonium salt of the formula:



in which R is as defined above and X' is the anionic residue of the mineral acid; b) maintaining said diazonium salt in the aqueous solution in which it is formed and reacting said diazonium salt with excess sulfurous acid in the presence of a mineral acid selected from the group consisting of hydrochloric acid and sulfuric acid at a temperature in the range of from minus 10° to plus 35°C. to obtain a dilute aqueous solution of a hydrazine acid addition salt of the formula:



in which R is as above defined and X'' is the mineral acid forming the acid addition salt; and c) maintaining said hydrazine acid addition in the aqueous solution in which it is formed, regulating the acidity of said aqueous solution at a pH not exceeding pH 5.0, heating said aqueous solution at a pH not exceeding pH 5.0 to a temperature of at least 40°C. to remove excess sulfurous acid in the form of sulfur dioxide and reacting said hydrazine acid addition salt with mucochloric or mucobromic acid in the aqueous solution in which the hydrazine is formed at a temperature of from 70° to 120°C. to obtain a 1-aryl-4,5-dihalopyridazone-6 of the formula:



in which R is as above defined and X is chloro or bromo.

3,935,211
CYCLOPROPYL 1,2,4-OXADIAZOLYLDIAZINES

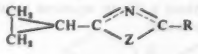
William Joseph Fanshawe, Pearl River, N.Y., and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 347,307, April 2, 1973, Pat. No. 3,857,843, which is a division of Ser. No. 288,219, Sept. 11, 1972, Pat. No. 3,770,739. This application Aug. 20, 1974, Ser. No. 498,901

Int. Cl.² C07D *237/14*

U.S. Cl. 260—250 A 2 Claims

1. A cyclopropyl-1,2,4-oxadiazolyldiazine of the formula:



wherein Z is a trivalent radical selected from the group consisting of

and

the dotted line represents one double bond, the position being dependent upon the definition of Z; R is pyridazinyl and a pharmaceutically acceptable salt thereof.

3,935,212
PESTICIDAL SUBSTITUTED 2-HYDROXYLAMINOPYRIMIDINYL PHOSPHORUS ESTERS

Graham Paul Cotterrell, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

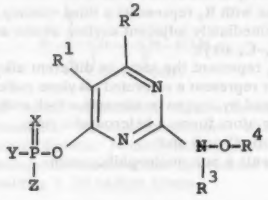
Filed Nov. 19, 1973, Ser. No. 417,088

Claims priority, application United Kingdom, Dec. 18, 1972, 58290/72

Int. Cl.² C07D *239/46*

U.S. Cl. 260—256.4 E 6 Claims

1. A compound of the formula:



or acid-addition salt thereof, wherein X is oxygen or sulphur; Y and Z are lower alkoxy or lower alkylamino; R^1 is hydrogen; R^2 is lower alkyl; R^4 is alkyl of 1 to 10 carbon atoms, and R^3 is hydrogen, lower alkyl or acetyl.

3,935,213
PROCESS FOR HYPOTENSIVE 4-AMINO-2-(PIPERAZIN-1-YL) QUINAZOLINE DERIVATIVES

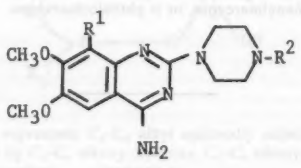
Hans-Jurgen E. Hess, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 5, 1973, Ser. No. 421,992

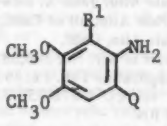
Int. Cl.² C07D *239/08*

U.S. Cl. 260—256.4 Q 17 Claims

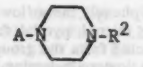
1. A process for the production of a compound of the formula



which comprises the steps of reacting a compound of the formula



or a salt thereof, with a compound of the formula



or a salt thereof, in a reaction-inert, organic solvent;

wherein R^1 is selected from the group consisting of hydrogen and methoxy;

R^2 is selected from the group consisting of alkenyl having from 3 to 5 carbon atoms, benzoyl, furoyl, thienylcarbonyl, alkoxycarbonyl having from two to five carbon atoms, alkenyloxycarbonyl having from 4 to 5 carbon atoms and (2-hydroxyalkoxy)carbonyl having from 4 to 5 carbon atoms;

Q is selected from the group consisting of cyano and =NH)—NH_2;

and A is —C(=NH)—X—R^3, wherein X is selected from the group consisting of O and S, and R^3 is alkyl having from 1 to 6 carbon atoms.

3,935,214

2- OR 3- KETO-3-OR-2-PHENYL-1,4-DISUBSTITUTED PIPERAZINES

Hugo Zellner, deceased, late of Linz-Ebelsberg, Austria (by Gertraud Zellner, administratrix), assignor to Donau-Pharmazie Gesellschaft m.b.H., Linz, Austria

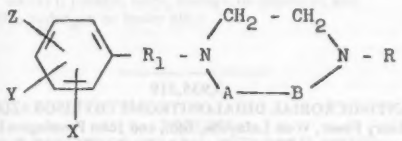
Continuation-in-part of Ser. No. 848,395, July 23, 1969. This application Feb. 20, 1973, Ser. No. 333,497

Claims priority, application Austria, July 26, 1968, 7306/68

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 MK **12 Claims**

1. A 1,4-disubstituted phenyl piperazine compound of the formula



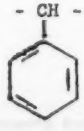
in which

X, Y, and Z are members selected from the group consisting of hydrogen, halogen, trifluoro lower alkyl, hydroxyl, lower alkoxy, and phenyl substituted lower alkoxy;

R is a member selected from the group consisting of di-lower alkylamino lower alkyl, piperidino lower alkyl and lower alkyl pyrrolidino;

R_1 is lower alkyl with 1 to 3 carbon atoms; and one of the groups A and B is a keto group of the formula

while the other one of the groups A and B is the phenyl substituted methylene group of the formula



;

or their pharmaceutically acceptable acid addition salts.

3,935,215

PROCESS OF REVERTING THIOPHOSPHATES

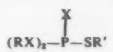
Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 165,336, July 22, 1971. This application June 29, 1973, Ser. No. 374,992

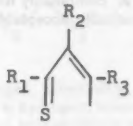
Int. Cl.² C07D *339/04*

U.S. Cl. 260—327 C **7 Claims**

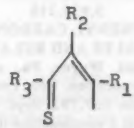
1. The process of reverting thiophosphates of the formula



where X is O or S, R is a hydrocarbon radical from the group consisting of alkyl, aryl, cycloalkyl, aralkyl and alkaryl and R' is a 3-thione-propene-1 group of the formula



or



where R_1, R_2 R_3 are hydrogen, alkyl, aryl, cycloalkyl, alkenyl, alkynyl, alkaryl, aralkyl or heterocyclic groups to the corresponding dithiolium compounds which comprises reacting said thiophosphates with an organic or inorganic acid.

3,935,216

PREPARATION OF TOLUOYL-5-PYRRYL-2-ACETONITRILE

Karl E. Wiegand, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 18, 1974, Ser. No. 451,817

Int. Cl.² C07D *207/32*

U.S. Cl. 260—326.5 J **6 Claims**

1. A process for preparing 5-benzoyl or p-toluoyl-1-methylpyrrole-2-acetonitrile comprising reacting a mixed anhydride of an aromatic acid selected from benzoic acid and p-toluic acid and an organosubstituted inorganic acid selected from methane sulfonic acid and toluene sulfonic acid with 1-methylpyrrole-2-acetonitrile in the presence of a solvent selected from nitromethane, 1,2-dichloroethane, methylene chloride and mixtures thereof.

3,935,217

SUBSTITUTED PYRROLIDINEMETHANOLS

Michio Nakanishi, and Hiroshi Yuki, both of Nakatsu, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

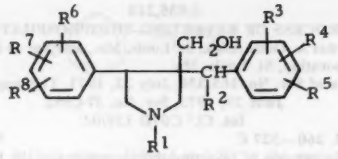
Filed Feb. 28, 1974, Ser. No. 446,841

Claims priority, application Japan, Feb. 28, 1973, 48-24528

Int. Cl.² C07D *207/08*

U.S. Cl. 260—326.5 R **21 Claims**

1. A substituted pyrrolidinemethanol of the formula:



wherein R^1 and R^2 are each a hydrogen atom or an alkyl group of 1 to 4 carbon atoms; R^3, R^4, R^5, R^6, R^7 and R^8 are each a hydrogen atom, a halogen atom, an alkyl group of 1 to 4 carbon atoms or an alkoxy group of 1 to 4 carbon atoms, or R^3 and R^4, or R^6 and R^7 combinedly form a methylenedioxy group; and pharmaceutically acceptable acid addition salts thereof.

3,935,218

IMIDAZOLINYL PHENYL CARBONYL COMPOUNDS ACID ADDITION SALTS AND RELATED COMPOUNDS

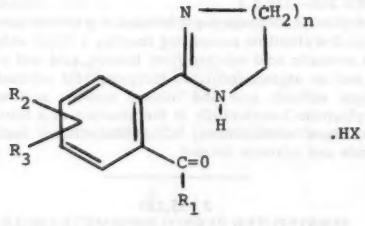
Theodore S. Sulkowski, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 757,792, Sept. 5, 1968, Pat. No. 3,763,178, which is a continuation-in-part of Ser. Nos. 622,918, March 14, 1967, abandoned, and Ser. No. 622,931, March 14, 1967, abandoned, and Ser. No. 576,833, Sept. 2, 1966, abandoned, and Ser. No. 487,587, Sept. 15, 1965, abandoned. This application Sept. 6, 1973, Ser. No. 394,708

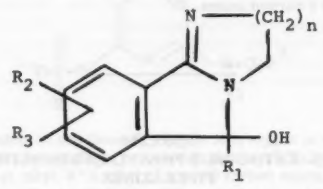
Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.6 **2 Claims**

1. A process for the preparation of acid addition salts having the formula:



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, phen(lower)alkyl, phenyl, monohalophenyl, dihalophenyl, mono(lower)alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl, di(lower)alkoxyphenyl, thienyl, pyridyl, furyl and tetrahydro-2-naphthyl; R_2 is selected from the group consisting of hydrogen, halogen, amino, lower alkylamino, lower alkyl and lower alkoxy; R_3 is hydroxy when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of phenyl, monohalophenyl, dihalophenyl, mono(lower)alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl, di(lower)alkoxyphenyl, thienyl, pyridyl, furyl and tetrahydro-2-naphthyl; n is 1; and HX is a pharmacologically acceptable acid, which comprises reacting a compound having the formula:



wherein R_1, R_2, R_3 and n are defined as above, with a pharmacologically acceptable acid in ethanolic solution.

3,935,219

ANTIMICROBIAL DIHALONITROMETHYLISOXAZOLES

Henry Feuer, West Lafayette, Ind., and John Pennington Lawrence, Stow, Ohio, assignors to Purdue Research Laboratory, Lafayette, Ind.

Filed Oct. 25, 1973, Ser. No. 409,558

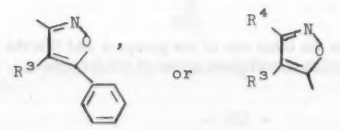
Int. Cl.² C07D *261/08*

U.S. Cl. 260—307 H **4 Claims**

1. A compound of the formula

$$R - CX_2NO_2$$

wherein X represents chloro or bromo;
R represents



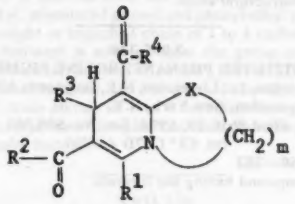
R^3 represents hydrogen or C_1–C_2 alkyl; R^4 represents C_1–C_3 alkyl.

3,935,220
TETRAHYDROIMIDAZOLO[1,2-A]PYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 337,477, Feb. 28, 1973, Pat. No. 3,856,798. This application May 10, 1974, Ser. No. 468,741
Claims priority, application Germany, Mar. 6, 1972, 2210633
Int. Cl.² C07D 213/46
U.S. Cl. 260—294.8 C 23 Claims

1. A compound of the formula:



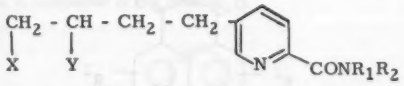
wherein
X is —NR⁵—;
m is 2;
R¹ is hydrogen or lower alkyl;
R² is lower alkoxy, lower alkoxy(lower alkoxy) or alkynyloxy of 2 to 4 carbon atoms;
R⁴ is lower alkoxy or alkynyloxy of 2 to 4 carbon atoms;
R³ is lower alkyl; phenyl; phenyl substituted by one or two substituents selected from the group consisting of lower alkyl, trifluoromethyl, cyano, halo, nitro and carbo(lower alkoxy); pyridyl; furyl; thienyl; or naphthyl; and
R⁵ is hydrogen or lower alkyl.

3,935,221
SUBSTITUTED FUSARIC ACID DERIVATIVES

Tetsuji Miyano; Kunio Suzuki, and Hiroshi Fukatsu, all of Nagoya, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Nagoya, Japan

Continuation-in-part of Ser. No. 257,834, May 30, 1972, Pat. No. 3,835,146. This application Apr. 17, 1974, Ser. No. 461,595
Claims priority, application Japan, May 28, 1971, 46-36220; Oct. 1, 1971, 46-76237
Int. Cl.² C07D 213/56
U.S. Cl. 260—295 AM 2 Claims

1. A halo-fusaric acid amide of the formula:



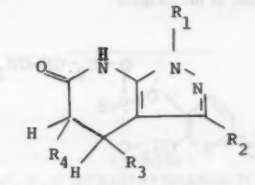
wherein X represents hydrogen or halogen; Y represents halogen; and R_1 and R_2 are same or different and represent hydrogen or a lower alkyl group.

3,935,222
1,4,5,7-TETRAHYDROPYRAZOLO[3,4-B]PYRIDIN-6-ONES

Hans Hoehn, Tegernheim, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 16, 1975, Ser. No. 568,754
Int. Cl.² C07D 471/06
U.S. Cl. 260—295.5 B 16 Claims

1. A compound of the formula



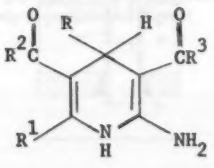
wherein R_1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl or furfuryl; R_2 is hydrogen, lower alkyl or phenyl; R_3 is hydrogen, lower alkyl, tri(halo)lower alkyl or phenyl, and R_4 is hydrogen, carboxy or carbo-lower alkoxy, and acid addition salts thereof.

3,935,223
2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Mar. 27, 1974, Ser. No. 455,305
Claims priority, application Germany, Mar. 6, 1972, 2210674
Int. Cl.² C07D 213/55
U.S. Cl. 260—295.5 R 4 Claims

1. A compound of the formula:



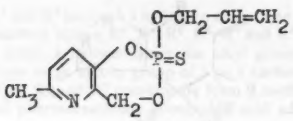
wherein
R is hydrogen; lower alkyl; alkenyl of 2 to 4 carbon atoms; alkynyl of 2 to 4 carbon atoms; phenyl; phenyl substituted by one, two or three substituents, one of said substituents being selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo, lower alkylsulfonyl, lower alkylsulfonyl. lower alkylthio and phenyl and the remainder being selected from the group consisting of lower alkyl, lower alkoxy, halogeno, and nitro; or naphthyl;
R¹ is hydrogen, lower alkyl, phenyl or pyridyl; and one of R² and R³ is lower alkyl and the other of R² and R³ is lower alkoxy, lower alkoxy, lower alkenyloxy or lower alkynyloxy.

3,935,224
4H-PYRIDO[3,2A]-1,3,2-DIOXOPHOSPHORANE DERIVATIVES

Kurt Rufenacht, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,641
Claims priority, application Switzerland, Dec. 10, 1971, 18066/71; Sept. 15, 1972, 13544/72
Int. Cl.² C07D 213/71
U.S. Cl. 260—294.8 C 4 Claims

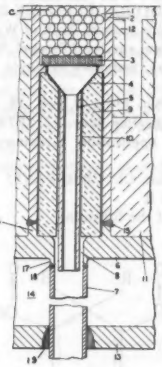
1. A compound of the formula



3,935,225
DEVICE FOR PERFORMING CATALYTIC ENDOTHERMIC REACTIONS

Hans-Dieter Marsch, Dortmund-Oespel, Germany, assignor to Friedrich Uhde GmbH, Dortmund, Germany

Filed Mar. 4, 1974, Ser. No. 447,520
Claims priority, application Germany, Apr. 10, 1973, 2317893
Int. Cl.² B01J 3/02, 3/04, 8/06
U.S. Cl. 23—289 5 Claims



1. In a device for performing catalytic reactions on a process gas, comprising in combination

a vertically disposed vessel,

an upright reaction tube in said vessel for receiving the process gas at the upper end portion and discharging the process gas at the lower end portion,

a grid in the upper portion of said reaction tube for supporting catalyst above the grid,

a process gas discharge tube of less diameter than said reaction tube and arranged concentrically therewith,

a connection between the top of said process gas discharge tube and said reaction tube adjacent said grid, and

thermal insulation between said process gas discharge tube and the inner wall of said reaction tube, the improvement comprising:

an inner tubesheet through which said process gas discharge tube freely extends,

an outer tubesheet spaced downstream from said inner tubesheet to provide an heat exchanger space therebetween for reception of a cooling fluid,

a cooling tube in liquid tight engagement with said inner tubesheet and extending through and rigidly connected to said outer tubesheet,

said process gas discharge tube extending without physical contact into said cooling tube, and

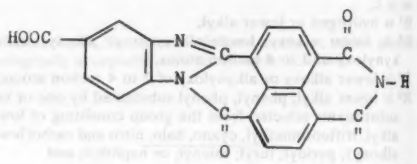
a rigid connection between said reaction tube and said upper tubesheet where cooling, insulation and process gas routing combine to reduce the temperature of said reaction tube, said reaction tube comprising heat-resisting steel, and said inner tubesheet comprising normal boiler structural steel.

3,935,226
SUBSTITUTED PHENANTHROLINE PIGMENTS

James J. Jordan, Jr., Livingston, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,302
Int. Cl.² C07D 487/06
U.S. Cl. 260—282 1 Claim

1. A compound having the formula

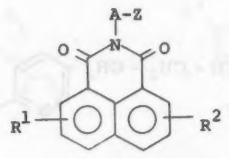


3,935,227
2-[(SUBSTITUTED-PIPERIDINYL OR TETRAHYDROPYRIDINYL)ALKYL]-1H-BENZ-[DE]ISOQUINOLINE-1,3(2H)-DIONES

Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

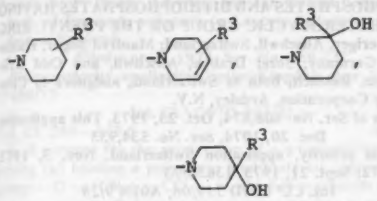
Filed Aug. 28, 1974, Ser. No. 501,411
Int. Cl.² C07D 401/06
U.S. Cl. 260—281 S 25 Claims

1. A compound of the formula



wherein R^1 and R^2 are each independently selected from the group consisting of hydrogen, chlorine, bromine, fluorine, straight or branched chain alkyl of 1 to 4 carbons, straight or branched chain alkoxy of 1 to 4 carbons, straight or branched chain alkylthio of 1 to 4 carbons, nitro, amino, cyano and

trifluoromethyl; A is a straight or branched chain alkylene of 1 to 8 carbons; and Z is selected from the group consisting of



wherein R^3 is selected from the group consisting of phenyl, phenyl-alkyl, substituted phenyl and phenyl-alkyl wherein said alkyl is straight or branched chain of 1 to 4 carbons and said phenyl substituent is selected from the group consisting of chlorine, bromine, fluorine, di(chloro), di(bromo), straight or branched chain alkyl of 1 to 4 carbons, di(methyl), straight or branched chain alkoxy of 1 to 4 carbons, nitro, amino, and trifluoromethyl; and the pharmaceutically acceptable acid addition salts thereof.

3,935,228
PREPARATION OF COBALT COMPLEX

Kestutis A. Keblys, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 141,993, May 10, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,635

Int. Cl.² C07D *213/16, 215/06*

U.S. Cl. 260—270 J **26 Claims**

14. A process for preparing solutions in pyridine/methanol of cobalt complexes which consists essentially of reacting (1) cobalt compound selected from cobalt oxides, cobalt sulfides, cobalt cyanides, cobalt salts of H_2SO_4, H_2SO_3, HNO_3, halogen acids, phosphorus acids, boric acids and carbonic acids, organic cobalt salts of sulfonic acids, phosphorus containing acids, and C_2–C_{20} carboxylic acids, (2) carbon monoxide, (3) hydrogen, (4) as pyridine selected from isoquinoline, pyridine and mono- and di-alkyl substituted pyridine wherein the alkyls are C_1–C_8, and (5) C_1–C_{10} alkanol such that (i) the molar ratio of H_2:CO is from 1:10 to 10:1, (ii) the molar ratio of said pyridine:cobalt is greater than about 2:1, and (iii) the volume ratio of pyridine:alkanol is from 3:1 to 1:3, at pressures ranging from about 1,000 to about 10,000 p.s.i.g., and temperatures ranging from 100°C. to 250°C.

3,935,229
ESTERS OF 2-[(4-QUINOLYL)AMINO]-BENZOIC ACIDS

Don Pierre René Lucien Giudicelli, Fontenay-sous-Bois; Henry Najer, Paris; Philippe Michel Jacques Manoury, L'Hay-les-Roses, and Andre Pierre Fernand Dumas, Bagneux, all of France, assignors to Synthelabo, Paris, France

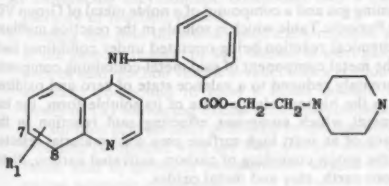
Filed Apr. 2, 1974, Ser. No. 457,174

Claims priority, application France, Apr. 6, 1973, 73.12505; May 9, 1973, 73.16635; Dec. 17, 1973, 73.44963

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 BQ **24 Claims**

1. A compound of the formula:



wherein

R_1 is chlorine, trifluoromethyl or trifluoromethylthio; and

R_2 is phenyl, chlorophenyl, methyl phenyl, trifluoromethylphenyl, trifluoromethoxyphenyl; di-methyl phenyl, chloro-methyl phenyl, di-trifluoromethyl phenyl or trifluoromethylthiophenyl or a pharmaceutically acceptable acid addition salt thereof, R_2 being a substituted phenyl when R_1 is chlorine.

3,935,230
α, α, α, α′, α′, α′-HEXAFLUORODI-M-TOLYLAMINE DERIVATIVES

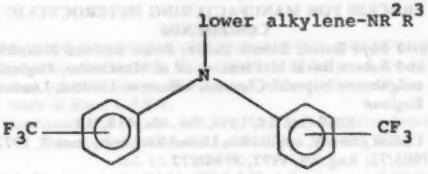
Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 300,049, Oct. 24, 1972, Pat. No. 3,830,842, which is a division of Ser. No. 71,234, Sept. 10, 1970, Pat. No. 3,712,921. This application June 14, 1974, Ser. No. 479,243

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 R **6 Claims**

1. A compound of the structure



wherein $-NR^2R^3$ is piperazino, (lower alkyl)piperazino, di(lower alkyl)piperazino or 2-hydroxyethylpiperazino, or a pharmaceutically acceptable salt thereof.

3,935,231
NOVEL BENZOTHIOPHENE DERIVATIVES AS STABILIZERS FOR ORGANIC COMPOUNDS

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

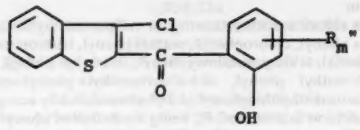
Filed Oct. 11, 1973, Ser. No. 405,462

Claims priority, application Switzerland, Oct. 17, 1972, 15187/72

Int. Cl.² C07D *333/56*

U.S. Cl. 260—330.5 **8 Claims**

1. A compound of the formula



wherein R_m'' is hydroxy, alkoxy (C_1-C_{18}), or a group

wherein R_3 is alkyl (C_1-C_{21}), phenyl or phenyl substituted by 1, 2 or 3 members of the group halo, hydroxy, 1 or 2 alkyls (C_1-C_{22}), 1 alkoxy (C_1-C_8) and phenylsulphonyl.

3,935,232

PROCESS FOR MANUFACTURING HETEROCYCLIC COMPOUNDS

David Boyd Baird; Ronald Baker; Brian Ribbons Fishwick, and Robert David McClelland, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

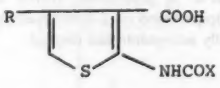
Filed Oct. 11, 1974, Ser. No. 514,319

Claims priority, application United Kingdom, June 9, 1972, 27005/72; Aug. 29, 1972, 39948/72

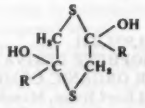
Int. Cl.² C07D *333/24*

U.S. Cl. 260—332.2 C **1 Claim**

1. A process for the manufacture of a compound of the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl and phenyl and X is selected from the group consisting of hydrogen, lower alkyl, chloromethyl and β-carboxyethyl, which comprises reacting a compound of the formula $HSCH_2OR$ or a dimer thereof having the formula



wherein R has the meaning given above, with cyanoacetic acid, lower alkyl cyanoacetate or cyanoacetamide in an aqueous alkaline medium at a temperature between 20° and 100°C, adding an acylating agent of an acid of the formula HOOCX wherein X has the meaning given above and acylating at a pH of between 4 and 10 by addition, as necessary, of an aqueous solution of an alkali.

3,935,233

O-METHYL/ETHYL-S-PROPYL/BUTYL-O-PHENYL THIOPHOSPHATES AND DITHIOPHOSPHATES HAVING AN O-HETEROCYCLIC GROUP OR THE PHENYL RING

Ernst Beriger, Allschwil, Switzerland; Manfred Boger, Haltingen, Germany; Jozef Drabek, Allschwil, and Odd Kristiansen, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

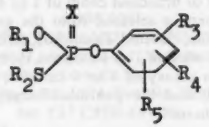
Division of Ser. No. 408,874, Oct. 23, 1973. This application Dec. 20, 1974, Ser. No. 534,933

Claims priority, application Switzerland, Nov. 3, 1972, 16043/72; Sept. 21, 1973, 13638/73

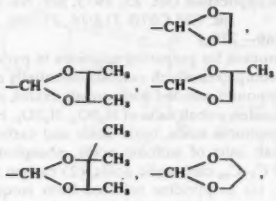
Int. Cl.² C07D *319/06*; A01N *9/28*

U.S. Cl. 260—340.7 **8 Claims**

1. A compound of the formula



wherein R_1 represents methyl or ethyl, R_2 represents n-propyl, isobutyl, or sec. butyl, R_3 and R_4 each represents hydrogen, chlorine, bromine, methyl or ethyl, R_5 represents



and X represents oxygen or sulphur.

3,935,234

CHEMICAL CONDENSATION IMPROVEMENT

Paul H. Reichenbacher, Elk Grove Village; Theresa M. Forsythe, Mount Prospect; Allen K. Sparks, Des Plaines, and Ted Symon, Lombard, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 172,573, Aug. 17, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 384,999

Int. Cl.² C07D *311/06*; C07C *69/76*, *65/02*

U.S. Cl. 260—343.2 R **9 Claims**

1. In the chemical condensation of phenol or benzene with acrylic acid or its methyl ester in the presence of an oxygen-containing gas and a compound of a noble metal of Group VIII of the Periodic Table which is soluble in the reaction medium, said chemical reaction being operated under conditions such that the metal component of said metal-containing compound is alternately reduced to a valence state of zero and oxidized back to the higher valence state of its soluble form, the improvement which comprises effecting said reaction in the presence of an inert high surface area solid material selected from the group consisting of carbon, activated carbon, diatomaceous earth, clay and metal oxides.

3,935,235

LACTONES

Francis R. F. Hardy, Chester, and Ian Robert King, Luton, both of England, assignors to Laporte Industries Limited, Luton, England

Filed Apr. 8, 1974, Ser. No. 459,227
Claims priority, application United Kingdom, Apr. 11, 1973, 17498/73
Int. Cl.² C07D *307/32*
U.S. Cl. 260—343.6 3 Claims

1. A process for the production of a γ-caprolactone comprising (a) heating a polymeric feed material containing the group — O — $(CR_2)_5$ —CO —, in which R represents a hydrogen atom or a methyl group, in a macrocylic ring or an acyclic chain, to a temperature of from 300°C to 500°C in the absence of added catalyst thereby to form an acyclic carboxylic acid whose δ atom is unsaturated and (b) cyclising said acyclic carboxylic acid by contacting it with a catalyst comprising a strong protonating agent, selected from the group consisting of strong acids, cation exchange resins in the free acid form, and strongly acidic mixtures containing hydrogen ions.

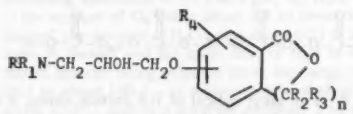
3,935,236

AMINOPROPANOL SUBSTITUTED ISOCHROMANONES AND PHTHALIDES

Elvio Bellasio, Como, Italy, assignor to Gruppo Lepetit, S.p.A., Milan, Italy

Filed May 24, 1974, Ser. No. 473,099
Claims priority, application United Kingdom, May 30, 1973, 25678/73
Int. Cl.² C07D *307/88*, *311/76*
U.S. Cl. 260—343.2 R 5 Claims

1. A compound of the formula I



I

wherein R is hydrogen, C_1-C_4 alkyl or hydroxy-(C_2-C_4) alkyl; R_1 is C_1-C_4 alkyl or hydroxy-(C_2-C_4) alkyl; R_2 and R_3 each independently represent hydrogen or C_1-C_3 alkyl, R_4 is hydrogen or alkoxy of 1 to 4 C, n is the number 1 or 2; and the pharmaceutically acceptable acid addition salts thereof.

3,935,237

METHOD OF SULFONATION OF AROMATIC HYDROCARBONS WITH MINIMIZED BY-PRODUCT FORMATION

Alfred Davidsohn, Locarno, Switzerland, assignor to Marni S.A., Luxemburg

Filed Mar. 6, 1974, Ser. No. 448,637
Claims priority, application Italy, Mar. 10, 1973, 12524/73
Int. Cl.² C07C *143/24*
U.S. Cl. 260—505 E 11 Claims

1. An improved method for the sulfonation of aromatic hydrocarbon compounds by a gaseous reagent consisting of reactant SO_3 diluted in inert diluent gases which comprises the steps of:

A. introducing the aromatic compound into a first of a plurality of reaction vessels;

B. feeding less than the stiochiometrically-required amount of the gaseous reagent of SO_3, diluted in inert gases, into each of said reaction vessels to react with a portion of said aromatic compound to form a liquid mixture in said vessel of (a) unreacted excess aromatic compound, (b) the sulfonic acid product produced by the reaction of the aromatic compound with the SO_3; and (c) some by-products, said by-products being soluble in said unreacted excess aromatic compound;

C. removing said mixture from said reaction vessels to a separation vessel;

D. separating said sulfonation product (b), from said unreacted excess aromatic compound (a) containing said dissolved by-product (c);

E. recovering said sulfonated product (b);

F. recycling to said first reaction vessel the unreacted aromatic compound (a) containing dissolved therein said by-products (c), whereby said by-products (c) achieve an inhibiting concentration for said by-product formation in said aromatic compound within the reaction vessels.

3,935,238

PREPARATION OF PHTHALATE ESTERS

Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., St. Davids, Pa.

Filed Jan. 15, 1973, Ser. No. 323,477
Int. Cl.² C07C *69/80*, *69/82*
U.S. Cl. 260—475 R 11 Claims

1. A process for the preparation of a lower alkyl ester of an aromatic carboxylic acid of the benzene or naphthalene series which comprises contacting the ammonium salt of an aromatic carboxylic acid with vapors of a lower alkanol at a temperature between about 230°C., and about 300°C. in the presence of an alkaline esterification catalyst selected from the group of oxides of silicon, titanium, aluminum, zirconium and thorium, said oxides containing at least about 0.2% by weight of an alkali metal oxide.

3,935,239

PROCESS FOR PRODUCING AROMATIC α-DIKETONES

Oyar Yanovich Neiland, ulitsa Raunaya, 45 korpus 3, kv. 127, and Yana Nikolaevna Kreitsberga, ulitsa Gorkogo 18, kv. 3, both of Riga, U.S.S.R.

Continuation of Ser. No. 252,464, May 11, 1972, abandoned.
This application Mar. 15, 1974, Ser. No. 451,597
Int. Cl.² C07C *69/76*, *49/76*
U.S. Cl. 260—469 4 Claims

1. A process for producing aromatic α-diketones, which comprises oxidizing 1,2-diphenylacetylene compounds with potassium permanganate in an aqueous acetone solution at a volumetric ratio of acetone to water of from 5:1 to 8:1 and at the boiling point of the reaction mixture.

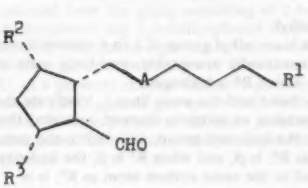
3,935,240

CYCLOPENTYLHEPTENOIC ACIDS AND DERIVATIVES

Keith Blakeney Mallion, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 26, 1973, Ser. No. 410,090
Claims priority, application United Kingdom, Nov. 10, 1972, 52010/72; Jan. 15, 1973, 2033/73; Aug. 15, 1973, 39578/73
Int. Cl.² C07C *69/76*
U.S. Cl. 260—469 6 Claims

1. An aldehyde of the formula:



I

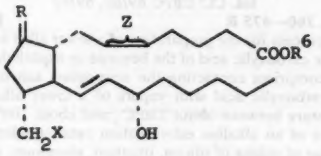
wherein R^1 is carboxy or alkoxycarbonyl of up to 11 carbon atoms, A is cis-vinylene, R^2 and R^3, which may be the same or different, are hydroxy, 3,5-dinitrobenzoyloxy or hydrocarbon aroyloxy of up to 15 carbon atoms and bearing 0 or 1 alkyl of 1 to 4 carbon atoms on carbon atom 2, 3 or 4.

3,935,241
11α-METHYLSUBSTITUTED PROSTAGLANDIN DERIVATIVES

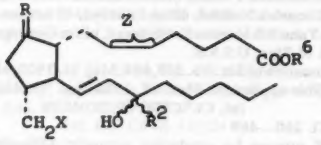
Joseph M. Muchowski, and Angel Guzman, both of Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 10, 1974, Ser. No. 468,772
Int. Cl.² C07C *147/02, 147/14, 149/26*
U.S. Cl. 260—468 D **7 Claims**

1. An 8R-antimeric or racemic compound selected from the group of those represented by the formulas:



(A)



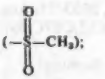
(B)

wherein

R is a keto group;

X is thiomethyl, methylsulfinyl

or methylsulfonyl



R^2 is methyl or ethyl;

R^4 is hydrogen, a lower alkyl group of 1 to 4 carbon atoms or the pharmaceutically acceptable, non-toxic salts of compounds in which R^4 is hydrogen,

Z is a cis double bond and the wavy lines ( ) indicate the α or β configuration or mixtures thereof, provided that when R^2 is α, the hydroxyl group, attached to the same carbon atom as R^2, is β, and when R^2 is β, the hydroxyl group, attached to the same carbon atom as R^2, is α.

3,935,242
PROCESS FOR THE PREPARATION OF COLORED MANEB

Pierre Fulconis, and Claude Franson, both of Marseille, France, assignors to Procida, Marseille, France

Filed July 10, 1974, Ser. No. 487,140
Claims priority, application France, July 13, 1973, 73.25758
Int. Cl.² C07F *13/00*
U.S. Cl. 260—429 K **10 Claims**

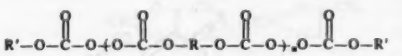
1. A process for the production of colored maneb consisting of the steps of reacting a water-soluble salt of manganese with a water-soluble salt of ethylenebis(dithiocarbamic acid) in the presence of a slightly basic aqueous reaction media, where said reaction media contains at least one water-soluble dyestuff dissolved therein, and recovering, as a precipitate, a colored maneb.

3,935,243
METHOD FOR PREPARING POLYPEROXYDICARBONATE ESTERS

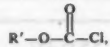
Duane B. Priddy, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 398,046, Sept. 17, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,181
Int. Cl.² C07C *68/00, 69/96*
U.S. Cl. 260—463 **8 Claims**

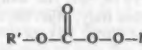
1. A process for preparing compounds having the formula



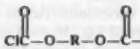
wherein R′ is an alkyl radical of 1–6 carbon atoms, R is an alkylene radical of 2–8 carbon atoms or a polyalkyleneoxy radical wherein each alkylene group has 2–4 carbon atoms and R has a maximum of about 12 carbon atoms, and n is an integer of at least 2, which comprises reacting sodium peroxide with an alkyl chloroformate of the formula



wherein R′ has the aforesaid significance, to form the sodium alkylperoxy carbonate



reacting a sodium alkyperoxycarbonate with a diol bis(chloroformate) of the formula



wherein R has the aforesaid significance, to form the corresponding peroxydicarbonate, said reaction being carried out at about −10°C. to about 20°C. in the presence of an aqueous lower alkanol.

3,935,244

HIGH PRESSURE REGENERATION OF A COKE-DEACTIVATED CATALYST CONTAINING PLATINUM, RHENIUM, HALOGEN & SULFUR

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 844,200, July 23, 1969, Pat. No. 3,622,520, which is a continuation-in-part of Ser. No. 805,380, March 7, 1969, abandoned. This application May 3, 1971, Ser. No. 139,911The portion of the term of this patent subsequent to Nov. 23, 1988, has been disclaimed.

Int. Cl.² B01J *23/96*; C10G *35/08*

U.S. Cl. 252—415 13 Claims

1. A method for regenerating a deactivated hydrocarbon conversion catalyst which is a combination of a platinum group component, a rhenium component, a halogen component and a sulfur component with an alumina carrier material, the catalyst having been deactivated by deposition of carbonaceous materials thereon during a previous contacting with a hydrocarbon charge stock at hydrocarbon conversion conditions, said method comprising the sequential steps of:

1. contacting the deactivated catalyst with a substantially sulfur-free first gaseous mixture consisting essentially of hydrogen, about 0.02 to about 3.6 mole % H_2O and HCl -- the mole ratio of H_2O to HCl contained therein being about 20:1 to about 100:1 -- at a temperature of about 350° to about 600°C. and at a pressure of about 1 to about 50 atmospheres for a period extending until the resulting effluent gas stream is substantially free of hydrogen sulfide;
2. purging hydrogen from contact with the catalyst resulting from step (1) with an insert gas stream;
3. subjecting the catalyst resulting from step (2) to contact with a substantially sulfur-free second gaseous mixture consisting essentially of an insert gas, O_2, H_2O, and HCl -- the amount of O_2 being about 0.2 to about 3 mole % thereof, the amount of H_2O being about 0.03 to about 3.6 mole % thereof and the mole ratio of H_2O to HCl contained therein being selected from the range of about 20:1 to about 100:1 -- at a temperature of about 375° to about 450°C. and at a pressure of about 7 to about 35 atmospheres for a period sufficient to substantially remove said carbonaceous materials;
4. treating the catalyst resulting from step (3) with said second gaseous mixture for a period of at least about 0.5 to about 10 hours at a temperature of about 450° to about 550°C. and at a pressure of about 7 to about 35 atmospheres;
5. purging oxygen from contact with the catalyst from step (4) with an inert gas stream; and,
6. subjecting the catalyst resulting from step (5) to contact with a substantially sulfur-free third gaseous mixture consisting essentially of hydrogen, about 0.03 to about 3.6 mole % H_2O, and HCl -- the mole ratio of H_2O to HCl contained therein being selected from the range of about 20:1 to about 100:1 -- at a temperature of about 300° to about 600°C. for a final period of at least about 0.5 to about 5 hours, thereby producing a regenerated hydrocarbon conversion catalyst having activity, selectivity, and stability characteristics comparable to those possessed initially by the fresh catalyst.

13. A method of regenerating a deactivated hydrocarbon conversion catalyst which is a combination of a platinum group component, a rhenium component, a halogen component and a sulfur component with an alumina carrier material, the catalyst having been deactivated by deposition of carbonaceous materials thereon during a previous contacting with a hydrocarbon charge stock at hydrocarbon conversion conditions, said method comprising a combination of the method defined in claim 1 with the step of sulfiding the catalyst resulting from step (6) at a temperature of about 20° to 550°C. to result in a regenerated catalyst containing about 0.01 to about 0.5 wt.% sulfur.

3,935,245

RADIOACTIVELY LABELED STEROID DERIVATIVES

Otto Engelfried; Bob Nieuweboer; Karl Petzoldt; Ulrich Kerb, and Klaus Lübke, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed June 4, 1974, Ser. No. 476,279

Claims priority, application Germany, June 8, 1973, 2330159

Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.1 16 Claims

1. a radioactive labeled steroid bearing the radical —X—N—R_1R_2 wherein —NR_1R_2 is a tritium- or carbon-14 labeled amino or aminoacid radical and X is R_3, —O—CO—R_3, =N—O—R_3 or —NH—CO—R_3 wherein R_3 is —$(CH_2)_n$—CO— in which n is an integer from 0 to 4, inclusive.

3,935,246

NAPHTHOQUINONES

Karl Bernauer, Allschwil; Erika Böhni, Basel, both of Switzerland, and Janos Borgulya, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

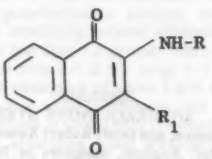
Filed Dec. 18, 1974, Ser. No. 533,902

Claims priority, application Switzerland, Jan. 10, 1974, 282/74

Int. Cl.² C07C *97/22*

U.S. Cl. 260—396 R 3 Claims

1. A compound represented by the formula



wherein R is cyclopentyl or cycloheptyl and R_1 is halogen or lower alkoxy.

3,935,247

OXIDATION OF ALKYLATED PHENOLS TO P-BENZOQUINONES

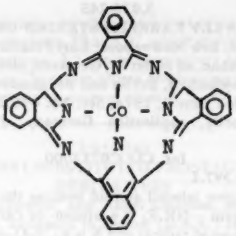
Vipin M. Kothari, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 28, 1973, Ser. No. 401,726

Int. Cl.² C07C *49/64*

U.S. Cl. 260—396 R 5 Claims

1. A process which comprises reacting an alkylated phenol selected from the group consisting of 2,6-dialkylphenol, 2,5-dialkylphenol and 2,3-dialkylphenol wherein the alkyl groups contain from one to eight carbon atoms with oxygen or oxygen bearing gas at a temperature of from about 0° C. to about 100° C. at a pressure of from about 10 pounds per square inch to about 1,000 pounds per square inch in the presence of from about ⅛ mole percent to 15 mole percent per mole of alkylated phenol of a cobalt phthalocyanine catalyst of the general formula



in the presence of a solvent selected from the group consisting of (I) n-alkyl substituted amides selected from the group consisting of dimethylformamide, cyclohexylmethylformamide, diphenylformamide, phenylmethylformamide, and 1-methyl-2-pyrrolidinone, (II) sulfoxides selected from the group consisting of dimethylsulfoxide, cyclohexylmethylsulfoxide, and phenylmethylsulfoxide, and (III) alkanols selected from the group consisting of methanol and ethanol.

3,935,248

ANTHRAQUINONE DYES

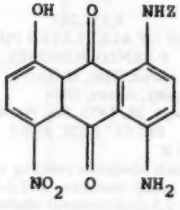
John Stuart Manson, and Denis Robert Annesley Ridyard, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 243,857, April 13, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,276

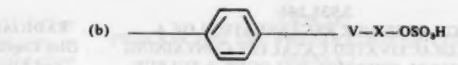
Int. Cl.² C07C *97/24*; C09B *1/16*

U.S. Cl. 260—378 **2 Claims**

1. A water-soluble anthraquinone dye having the formula



wherein Z represents a member selected from the group consisting of (a) -X-OSO_3H wherein X represents alkylene containing 2 to 5 carbon atoms and



wherein V represents oxygen, sulphur, ethylimino or a direct link and X represents ethylene.

3,935,249

TAR REDUCTION BY INORGANIC HALIDE FOR REACTION OF UNSATURATED ANHYDRIDE AND POLYBUTENE

Imre Puskas, Glen Ellyn, and John A. Cengel, Wheaton, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 10, 1973, Ser. No. 358,914

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 R **3 Claims**

1. In the reaction between 300–3,000 M_n butene polymer and maleic anhydride to prepare polybutenyl-substituted succinic anhydride, the improvement comprising conducting said reaction at a temperature of from 150° to 300°C in the presence of 5–200 ppm based on said polymer of dry hydrogen chloride or calcium bromide.

3,935,250

N-LOWER ALKYL, N-LOWER ALKYLIMINOMETHYL CARBAMIC ACID ESTERS OF αNAPHTHOL AND SUBSTITUTED PHENOLS

Georg Pissiotas, Lorrach, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

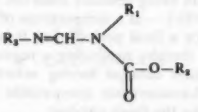
Filed Oct. 1, 1973, Ser. No. 402,648

Claims priority, application Switzerland, Oct. 12, 1972, 14963/72; July 30, 1973, 10999/73

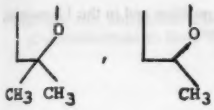
Int. Cl.² C07D *307/79*

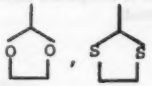
U.S. Cl. 260—346.2 R **6 Claims**

1. A compound of the formula

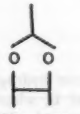


or salts thereof, wherein R_1 represents C_1–C_4 alkyl, R_2 represents α-naphthyl or phenyl substituted by halogen, C_1–C_3 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, alkoxyalkyl with one to four carbon atoms in each alkyl moiety, C_1–C_4 alkylthio, C_3–C_4 alkynyloxy, di-(C_1–C_4) alkylamino, di-(C_3–C_5) alkenylamino, di-(C_3–C_5) alkynylamino, hydroxy, cyano, nitro, cyclopentyl, mono-(C_1–C_4) alkylaminomethyleneamino, di-(C_1–C_4) alkylaminomethyleneimino,

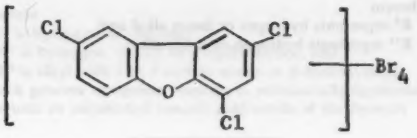




or



groups, and R_3 represents C_{1-C_4} alkyl.

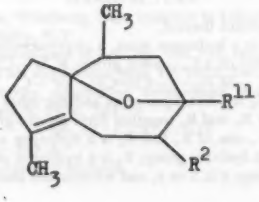


3,935,252
METHOD OF MANUFACTURING FUNGIBLE POLYTETRAMETHYLENE ETHER GLYCOL
Hideo Tomomatsu, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Sept. 18, 1974, Ser. No. 566,968
Int. Cl.² C07D 307/34
U.S. Cl. 260—346.1 R 3 Claims

1. In a method for manufacturing polytetramethylene ether glycol in which ingredient tetrahydrofuran is polymerized with a tetrahydrofuran-polymerization catalyst to form a catalytically active tetrahydrofuran-catalyst-polymer mixture, and wherein the catalytic activity of said catalytically active mixture is terminated by the addition of water or 1,4-butene diol thereto, wherein the resulting mixture includes excess tetrahydrofuran and polytetramethylene ether glycol, wherein said resulting mixture is subjected to distillation for removal of said excess tetrahydrofuran therefrom, to contact with solid neutralizing agents, and to mechanical separation steps for removal of water therefrom, the improvement comprising: prior to contacting of said ingredient tetraphydrofuran with the tetrahydrofuran-polymerization catalyst, contacting liquid tetrahydrofuran containing n-butyl aldehyde and having a water content of less than 0.5 percent with a molecular sieve having a nominal pore size in the range 4–5 A inclusive and having a heat of adsorption of about 1,800 btu/pound water ± 100 but/pound of water, continuing said contacting until said n-butyl aldehyde is completely removed from the liquid tetrahydrofuran, separating liquid tetrahydrofuran from the molecular sieve, and using the separated tetrahydrofuran as said tetrahydrofuran ingregient.

3,935,253
NOVEL ODORANT
Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.
Filed May 23, 1973, Ser. No. 363,207
Claims priority, application Switzerland, June 5, 1972, 8265/72
Int. Cl.² C07D 311/02
U.S. Cl. 260—345.2 5 Claims

1. A compound of the formula



III

3,935,251
2,4,8-TRICHLORO-TRI AND TETRA BROMODIBENZOFURANS
Joachim Dazzi, Riehen; Rudolf Kirchmayr, Munchenstein, and Henri Dietrich, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Mar. 7, 1974, Ser. No. 449,176
Claims priority, application Switzerland, Mar. 20, 1973, 4028/73
Int. Cl.² C07D 307/91
U.S. Cl. 260—346.2 M 2 Claims

1. A 2,4,8-Trichloro-tetrabromodibenzofuran of the formula

wherein
R^2 represents hydrogen or lower alkyl and
R^{11} represents hydrogen or lower alkyl.

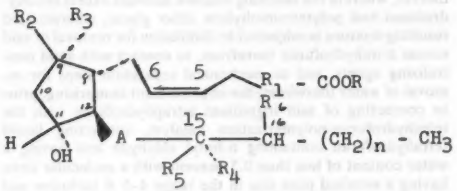
3,935,254

5C-PROSTEN-13-YNOIC ACIDS

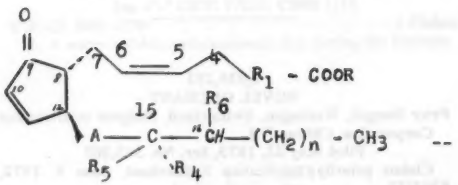
Carmelo Gandolfi; Gianfederico Doria, both of Milan, and Pietro Gaio, Belluno, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

Filed Mar. 30, 1973, Ser. No. 346,249
Claims priority, application Italy, Apr. 13, 1972, 23063/72; Apr. 28, 1972, 23662/72
Int. Cl.² C07C 61/38, 61/71
U.S. Cl. 260—514 D 18 Claims

1. Compounds having general formulas (I)



(I)



(II)

and the racemates thereof,
wherein R is a hydrogen atom, a pharmaceutically acceptable cation or a C_{1-12} alkyl group; R_1 is $—CH_2CH_2—$, $—OCH_2—$, $—SCH_2—$, $—CH=CH—$ or $—C\equiv C—$; one of R_2 and R_3 is a hydrogen atom and the other is a hydroxy group or R_2 and R_3 together form an oxo-group; A is $—C\equiv C—$, one of R_4 and R_5 is a hydrogen atom and the other is a hydroxy group; R_6 is a hydrogen atom or a C_{1-4} alkyl group; n is 3 or 4; and wherein the chains bound to the carbon atoms in the 8-position and in the 12-position have the trans-configuration.

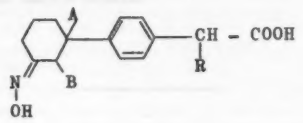
3,935,255

PHENYLACETIC ACID DERIVATIVES

Jacques Georges Maillard, Paris, France, assignor to Laboratoires Jacques Logeais, Issy-les-Moulineaux, France

Filed Aug. 28, 1974, Ser. No. 501,455
Claims priority, application France, Sept. 17, 1973, 73.33276
Int. Cl.² C07C 119/14; A01N 9/20
U.S. Cl. 260—518 R 2 Claims

1. A compound selected from the compounds having the formula



(1)

in which R is selected from hydrogen and alkyl having 1–4 carbon atoms and A and B, when taken separately, each represent a hydrogen atom and, when taken together, form a carbon-carbon bond, and their therapeutically acceptable salts with inorganic and organic bases.

3,935,256

PROCESS FOR THE PRODUCTION OF THE CALCIUM SALT OF PANTOTHENIC ACID

John F. Verbeeck, Libertyville, Ill., assignor to Thompson-Hayward Chem. Co., Kansas City, Kans.

Filed Sept. 6, 1974, Ser. No. 503,796
Int. Cl.² C07C 99/04, 99/10
U.S. Cl. 260—534 A 3 Claims

1. An improved process for the preparation of the calcium salt of pantothenic acid which comprises the steps of
reacting acrylonitrile with ammonia in aqueous solution to from beta-aminopropionitrile;
hydrolysis of beta-aminopropionitrile in the presence of sodium hydroxide to form the sodium salt of beta-alanine;
reacting the sodium slat of beta-alanine with calcium chloride in a liquid which will from an azeotropic mixture with water to form the calcium salt of beta-alanine;
removing water from the reaction mixture by azeotropic distillation to form an anhydrous calcium salt of beta-alanine; and

reacting the anhydrous calcium salt of beta-alanine with dl-pantolactone to form dl-calcium pantothenate.

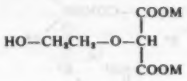
3,935,257

CHEMICAL COMPOUNDS

Dennis A. Ruest, Manchester; C. Y. Shen, St. Louis, and John L. Mason, University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 18, 1974, Ser. No. 452,307
Int. Cl.² C07C 59/12
U.S. Cl. 260—535 P 3 Claims

1. Compounds represented by the formula



wherein M is alkali metal, and acids thereof.

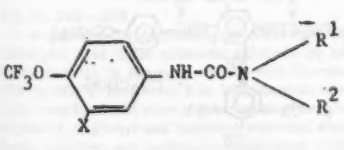
3,935,258

PROCESS FOR MAKING N-ARYLUREA COMPOUNDS AND HERBICIDAL COMPOSITIONS CONTAINING SAME

Jan Hempel, Leverkusen, and Erich Klauke, Odenthal-Hahnenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 1, 1972, Ser. No. 258,705
Claims priority, application Germany, June 12, 1971, 2129200
Int. Cl.² C07C 127/19
U.S. Cl. 260—553 A 5 Claims

1. Process for the preparation of a substituted N-phenylurea compound of the formula



(I),

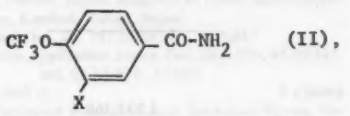
wherein

X is hydrogen or chlorine;

R^1 is hydrogen, methyl or β-hydroxyethyl, and

R^2 is alkyl with 1 to 3 carbon atoms or β-hydroxyethyl

which process comprises reacting in substantially equimolar amounts an substituted benzoic acid amide of the formula

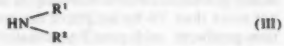


(II),

in which

X is defined as above,

with an alkali metal hypohalite or an alkaline earth metal hypohalite at a temperature of from 0° to 40°C in the presence of water as a diluent, and adding to the resulting aqueous solution an amine of the general formula



(III)

in which

R^1 and R^2 have the meanings stated above, and then reading at an elevated temperature of 50°– 70°C.

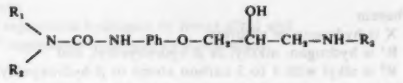
3,935,259

AMINES AND PROCESSES FOR THEIR MANUFACTURE

Max Wilhelm, Watchung, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 101,393, Dec. 24, 1970, abandoned. This application May 17, 1973, Ser. No. 361,373
Claims priority, application Switzerland, Nov. 13, 1970, 16788/70; Jan. 8, 1970, 204/70
Int. Cl.² C07C 127/18
U.S. Cl. 260—553 A 8 Claims

1. A compound of formula



wherein R_1, R_2 and R_3 each represent lower alkyl having up to 7 carbon atoms or R_1 is hydrogen, Ph represents a meta- or paraphenylene bivalent radical, unsubstituted or substituted by a member of the group consisting of allyl, allyloxy, lower alkoxy of up to 4 carbon atoms, chlorine or bromine, and salts thereof with pharmaceutically acceptable acids.

3,935,260

AUTO-CONDENSATION PRODUCTS OF UREA

Fritz Dieter Schlosser, Germiston, South Africa, assignor to African Explosives & Chemical Industries Limited, Transvaal, South Africa

Continuation of Ser. No. 190,273, Oct. 18, 1971, abandoned. This application Oct. 18, 1973, Ser. No. 407,512

Claims priority, application South Africa, Oct. 21, 1970, 70/7156

Int. Cl.² C07C *127/24*

U.S. Cl. 260—553 B **19 Claims**

1. Process for producing a partuculate mixture of auto-condensation products of urea containing predominantly biuret which is suitable as a non-protein nitrogen supplement for ruminant feeds comprising heating at a temperature between 150°C and 180°C with continuous stirring in a reaction vessel having a smooth surface, finely divided urea dispersed in a non-toxic branched chain paraffin which is inert to urea and its auto-condensation products, has a boiling point in the range of 150° and 180°C and in which urea or its auto-condensation products have a solubility at ambient temperature of not more than 5% by weight of the urea of its auto-condensation products, said paraffin containing a non-toxic surface active agent selected from the group consisting of cationic surface active agents, nonionic surface active agents, anionic surface active agents and mixtures of cationic and anionic surface active agents in an amount of from 0.01 to 1.0 percent m/m of the initial quantity of urea, continuing said heating until at least 90 percent of the urea is converted into said mixture of auto-condensation products and separating the particulate mixture thus formed from the branched chain paraffin.

3,935,261

CYCLOPENTANE DERIVATIVES

Michael Peter Lear Caton, Upminster; Edward Charles John Coffee, London, and Gordon Leonard Watkins, Dagenham, all of England, assignors to May & Baker Limited, England

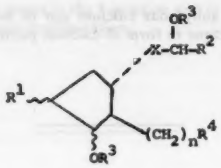
Division of Ser. No. 343,460, March 21, 1973, Pat. No. 3,884,942, which is a continuation-in-part of Ser. No. 108,981, Jan. 22, 1971, abandoned. This application Sept. 3, 1974, Ser. No. 502,976

Claims priority, application United Kingdom, Jan. 23, 1970, 3494/70; Mar. 2, 1973, 10402/73

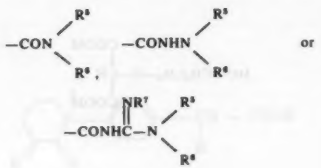
Int. Cl.² C07C *102/00*, *103/37*

U.S. Cl. 260—557 R **3 Claims**

1. A cyclopentane compound of the formula:



wherein R^1 represents a hydrogen atom or a lower alkyl group, R^2 represents a straight- or branched-chain alkyl group of 1 to 10 carbon atoms, R^3 represents a hydrogen atom or a lower alkyl, lower alkenyl, phenyl-(lower)alkyl and lower alkanoyl group, R^4 represents a group of formula:



wherein R^5, R^6 and R^7 each represents a hydrogen atom or a lower alkyl group, X represents a vinylene, ethylene, or cyclopropylene group, and *n* represents 5, 6, 7 or 8.

3,935,262

OXICHROMIC COMPOUNDS, STABILIZED OXICHROMIC COMPOUNDS AND PROCESSES FOR PREPARING SAME

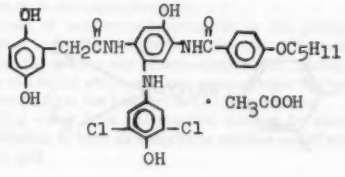
Gregory James Lestina, Rochester, and Walter Monroe Bush, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 206,949, Dec. 10, 1971, abandoned, and a continuation-in-part of Ser. No. 308,869, Nov. 22, 1972, Pat. No. 3,880,658. This application Sept. 27, 1973, Ser. No. 401,327

Int. Cl.² C07C *103/22*

U.S. Cl. 260—559 R **36 Claims**

10. A compound according to claim 1 having the formula:

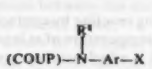


3,935,263
OXICHROMIC COMPOUNDS, STABILIZED OXICHROMIC COMPOUNDS AND PROCESSES FOR PREPARING SAME

Gregory James Lestina, Rochester, and Walter Monroe Bush, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 206,949, Dec. 10, 1971, abandoned, Continuation-in-part of Ser. No. 308,869, Nov. 22, 1972, Pat. No. 3,880,658. This application Dec. 19, 1973, Ser. No. 426,177
Int. Cl.² C07C *103/20*
U.S. Cl. 260—559 R 10 Claims

1. A compound having the formula:



wherein (COUP) is a photographic color coupler connected to said nitrogen atom in said formula at the coupling position to provide a reduced azomethine linkage; Ar is an aromatic group containing a carbocyclic arylene nucleus and comprises from 6 to 20 carbon atoms; R^2 is a carbonyl-containing group of the formula:

wherein R^4 is a) an alkyl group or substituted alkyl group containing from 1 to 12 carbon atoms or b) an aryl group or substituted aryl group containing from 6 to 12 carbon atoms; and X is an hydroxy group, an amino group, an alkylamino group, or the group:

3,935,264
HYDROGENATION OF DINITROTOLUENE TO TOLUENE DIAMINE

Sudhir K. Bhutani, West Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed June 19, 1974, Ser. No. 480,796
Int. Cl.² C07C *85/10*
U.S. Cl. 260—580 13 Claims

1. In a process for preparing toluene diamine which comprises reacting dinitrotoluene with hydrogen in the presence of an aliphatic alcohol solvent and a hydrogenation catalyst comprised of nickel, platinum or palladium, the improvement which comprises carrying out said reaction in the presence of a proportion of carbon monoxide ranging from about 0.1 to about 10 percent by volume based on the volume of hydrogen which is used.

3,935,265
VAPOR PHASE CONVERSION OF AROMATIC ESTERS TO AROMATIC ALDEHYDES

Allen Feinstein, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 9, 1974, Ser. No. 468,429
Int. Cl.² C07C *45/00*
U.S. Cl. 260—599 5 Claims

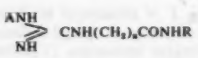
1. A process for converting an alkyl ester of an aromatic carboxylic acid to an aromatic aldehyde by contacting said aromatic ester in the vapor phase with alumina from about 400° to 500°C for about 3 to 100 seconds wherein the aromatic moiety of said ester is selected from the group consisting of phenyl, naphthyl and biphenyl moieties, wherein said aromatic moieties are optionally substituted with substituents selected from the group consisting of halo, alkyl, hydroxyl, carboxyl, amino, alkoxy, alkylthio, aryloxy, cyano, and nitro radicals, the said alkyl moiety of said ester is unsubstituted and is free of β-hydrogens.

3,935,266
N-SUBSTITUTED GUANIDINO ACID DERIVATIVES

Sadao Hashimoto; Ryuji Sakakibara; Yasushi Kurashige; Katsuo Takikawa; Yoko Osame; Hiroshi Minami, and Takashi Suzue, all of Naruto, Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

Filed Oct. 26, 1971, Ser. No. 192,557
Claims priority, application Japan, Oct. 28, 1970, 45-95341
Int. Cl.² C07C *103/30*
U.S. Cl. 260—561 A 3 Claims

1. An N-substituted guanidino acid derivative having the following formula of



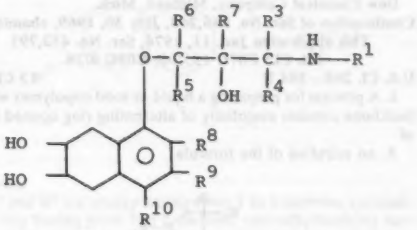
wherein R is an alkyl having 6 to 15 carbon atoms or phenethyl; A represents an alkyl having 1 to 4 carbon atoms, an alkenyl having 2 to 4 carbon atoms and cyclo hexyl; and n is an integer of 5.

3,935,267
TETRAHYDRONAPHTHYLOXY-AMINOPROPANOLS AND SALTS THEREOF

Frederic Peter Hauck, Somerville; Christopher M. Cimarusti, Somerset, and Venkatachala Lakshmi Narayanan, Hightstown, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 48,458, June 22, 1970, abandoned. This application Dec. 1, 1971, Ser. No. 203,865
Int. Cl.² C07C *93/06*
U.S. Cl. 260—570.7 7 Claims

1. Compounds of the structure



and stereoisomers and salts thereof, wherein R^1 is lower alkyl; R^3, R^4, R^5, R^6 and R^7 are the same or different and are selected from the group consisting of hydrogen and lower alkyl; and R^8, R^9 and R^{10} are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and cycloalkyl.

3,935,268

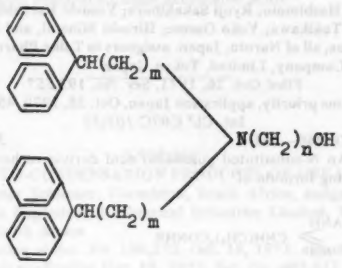
ω-[BIS(ω,ω-DIPHENYLALKYL)AMINO]ALKAN-1-OL AND THEIR SALTS

Hidehiko Kaneko, Minoo; Jiro Aritomi, Nara, both of Japan, and Yuzuru Yamato, deceased, late of Minoo, Japan by Akiko Yamato, Hiroshi Yamato, Yumi Yamato, heirs, all of Minoo, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Int. Cl.² C07C 91/22

U.S. Cl. 260—570 R 3 Claims

1. ω-[Bis(ω,ω-diphenylalkyl)amino]alkan-1-ol of the formula:



wherein *m* is 2 and *n* is 2 or 3 and the pharmaceutically acceptable acid addition thereof.

3,935,269

COPOLYMERS OF N-SUBSTITUTED AZIRIDINES AND EPOXIDES EPISULFIDES

Prella M. Phillips; Clarence R. Dick, both of Lake Jackson, and Joseph M. Baggett, Freeport, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

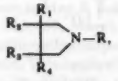
Continuation of Ser. No. 846,263, July 30, 1969, abandoned. This application Jan. 11, 1974, Ser. No. 432,791

Int. Cl.² C07C 135/00; C08G 6/26

U.S. Cl. 260—584 B 13 Claims

1. A process for preparing a liquid or solid copolymer whose backbone consists essentially of alternating ring opened units of

A. an aziridine of the formula



wherein

1. R is an inert organic group;
2. R_1, R_2, R_3 and R_4 are hydrogen, alkyl aryl or aralkyl groups, at least two of them being hydrogen; and

B. a vicinal epoxide of the formula

wherein

1. X is oxygen
2. R_5, R_6, R_7 and R_8 are hydrogen, alkyl, aryl, alkaryl, aralkyl, alkenyl, alkoxyalkyl, alkenyloxyalkyl, or R_5 and R_7 join to form a five or six membered cycloalkyl group, at least two of them being hydrogen;

said copolymer being water insoluble when R is a hydrocarbon radical of at least six carbon atoms, X is oxygen and R_1–R_8 are each hydrogen:

said process comprising reacting by contacting (A) with (B) in liquid phase at a temperature of at least about 130°C;

provided that when R is a hydrocarbon group of at least six carbon atoms, and R_1–R_8 are each hydrogen, the process comprises the additional step of recovering a water-insoluble copolymer.

3,935,270

PROCESS FOR THE PREPARATION OF CYCLOHEXADECENONES AND DERIVATIVES

Nissim Calderon, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 664,907, Sept. 1, 1967, Pat. No. 3,439,056. This application Feb. 23, 1968, Ser. No. 707,486The portion of the term of this patent subsequent to Apr. 15, 1986, has been disclaimed.

Int. Cl.² C07C 45/04

U.S. Cl. 260—586 P 4 Claims

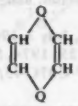
1. The method for the preparation of alicyclic ketones which contain 16 carbon atoms in the alicyclic ring which comprises subjecting an alicyclic compound corresponding to the formula:

wherein

1. Q comprises a sequence of six carbon atoms situated in linear succession between the methylidene carbons which constitute the double bond;
2. the carbon atoms in the linear succession of Q may be interconnected by both carbon-carbon single bonds and carbon-carbon double bonds;
3. any of the carbon atoms in the linear succession of Q may be substituted by alkyl radicals; and
4. said alicyclic compounds containing no conjugated double bonds,

while said hydrocarbon is diluted to about 10% in an inert diluent to a catalyst comprising (A) at least one organometallic compound wherein the metal is selected from the group consisting of Ia, IIa, IIb and IIIa groups of the Periodic Table of Elements, the organo portion of said organometallic compound being selected from the group consisting of trialkyls, triaryls, dialkyl halides, alkyl dihalides, dialkyl hydrides, diaryl hydrides, aryl dihydrides and aryl halides; (B) at least one metal salt selected from the group consisting of molybdenum and tungsten halides, acetylacetonates, sulfates, phosphates and nitrates; and (C) at least one compound of the general formula R—Y—H wherein Y is selected from the group of oxygen and sulfur and wherein R is a radical selected from the group consisting of (1) hydrogen, (2) alkyl, (3) aryl, (4) arylalkyl, (5) alkaryl, (6) alkenyl, (7) when Y is S, R is thioalkyl, thioarylalkyl and thioalkaryl, (8) when Y is O, R is alkoxy, arylalkoxy and alkaryloxy and (9) radicals of (2) through (6) wherein at least one hydrogen of said radicals is substituted by a material selected from hydroxyl (OH) and thiol (SH) groups, wherein the molar relationship between catalyst component (A), (B) and (C) are within a molar ratio of B/C

ranging from about 0.3/1 to at least about 20/1, and the molar ratio of A/B is within the range of about 0.5/1 to at least 15/1, to form at least one cyclic polyolefin corresponding to the formula:



wherein

1. Q comprises a sequence of six carbon atoms situated in linear succession between the methylidene carbons which constitute the double bond;
2. the carbon atoms in the linear succession of Q may be interconnected by both carbon-carbon single bonds and carbon-carbon double bonds;
3. any of the carbon atoms in the linear succession of Q may be substituted by alkyl radicals; and
4. said alicyclic compounds containing no conjugated double bonds,

and subsequently subjecting said cyclic polyolefin to a sequence of reactons whereby at least one and not more than two of the —CH=CH— groups are converted to a

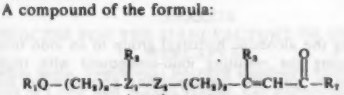
group to form a cyclic compound containing 16 carbon atoms in the alicyclic ring and containing one or two carbonyl functional groups.

3,935,271
UNSATURATED ALIPHATIC KETONES

Hans-Peter Schelling, Oberwil, and Fritz Schaub, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 257,671, May 30, 1972, abandoned. This application Dec. 19, 1973, Ser. No. 426,229
Claims priority, application Switzerland, June 2, 1971, 8036/71
Int. Cl.² C07C *49/24*
U.S. Cl. 260—594 **5 Claims**

1. A compound of the formula:



wherein

R_1 is alkyl of 1 to 10 carbon atoms; alkenyl of 3 to 10 carbon atoms; alkynyl of 3 to 10 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; cycloalkenyl of 5 to 7 carbon atoms; cycloalkenyl of 5 to 7 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; cycloalkyl (of 3 to 6 carbon atoms)alkyl (of 1 to 4 carbon atoms); cycloalkyl(of 3 to 6 carbon atoms)alkyl (of 1 to 4 carbon atoms) ring substituted by alkyl of 1 to 4 carbon atoms; cycloalkenyl(of 5 to 7 carbon atoms)alkyl (of 1 to 4 carbon atoms); or cycloalkenyl (of 5 to 7 carbon atoms) alkyl (of 1 to 4 carbon atoms) ring substituted by alkyl of 1 to 4 carbon atoms;

R_2 and R_3, which are the same or different are each hydrogen or alkyl of 1 to 4 carbon atoms,

R_7 is alkyl of 1 to 5 carbon atoms;

Q is oxygen or sulphur;

$-Z_1-Z_2-$ is $-CH-CH_2-$ or $-C=CH$; and

n is an integer 1, 2 or 3.

3,935,272
PROCESS FOR THE OXIDATION OF OLEFINE COMPOUNDS

Robert Chapurlat, Rhone, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed May 2, 1972, Ser. No. 249,510
Claims priority, application France, May 3, 1971, 71.15774
Int. Cl.² C07C *45/04*
U.S. Cl. 260—597 R **15 Claims**

1. Process for the production of acetone by oxidising propylene in an oxygen-free atmosphere, in the gas phase, in the absence of water or in the presence of up to 5% by weight of water, using, as oxidising agent, an oxy-metal compound containing one or more oxygen atoms directly bonded to the metal and not bonded to an organic radical, selected from an oxo-metal compound of the general formula:

$$[(L)_x(O)_yM\text{-}Q]_pM(O)_n(L)_z]^m\ A \qquad (I)$$

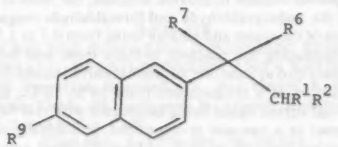
in which M represents V, L represents a monodentate or polydentate ligand, A represents an organic or inorganic anion or cation, Q represents oxygen or sulphur, x is an integer greater than or equal to zero, p is equal to zero or one, m is a positive or negative integer and n is an integer greater than or equal to zero such that there is one or more oxygen atoms directly bonded to the metal and not bonded to an organic radical.

3,935,273
NAPHTHYL ACETALDEHYDE DERIVATIVES

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Division of Ser. No. 222,278, Jan. 31, 1972, Pat. No. 3,821,253, which is a division of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713, Continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012. This application Apr. 25, 1974, Ser. No. 464,029. The portion of the term of this patent subsequent to Dec. 7, 1988, has been disclaimed.
Int. Cl.² C07C *47/52*
U.S. Cl. 260—600 R **11 Claims**

1. A compound selected from the group of compounds represented by the formula:



(A)

wherein

R^1 and R^2 are alkoxy having from 1 to 6 carbons, cycloalkoxy having from 3 to 7 carbons, cycloalkylmethoxy having from 4 to 8 carbons, 2-cycloalkylethoxy having 5 to 9 carbons, 3-cycloalkylpropoxy having from 6 to 10 carbons, monocyclic arylmethoxy having from 7 to 13 carbons, 2-phenylethoxy or 3-phenylpropoxy; or R^1 and R^2 taken together are oxo;

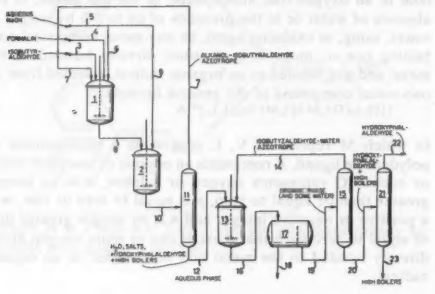
one of R^6 and R^7 is hydrogen and the other is hydrogen, methyl, ethyl or difluoromethyl; or R^6 and R^7 taken together are methylene, ethylene or halomethylene; and

R^9 is difluoromethoxy, alkoxymethyloxy having up to 7 carbons, difluoromethylthio, alkoxymethylthio having up to 6 carbons, or alkylthiomethylthio having up to 7 carbons.

3,935,274
PROCESS FOR THE CONTINUOUS PREPARATION OF HYDROXYPIVALDEHYDE

Günter Jacobsen, Frankfurt am Main; Hans Fernholz, Fischbach, Taunus, and Dieter Freudenberger, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 21, 1969, Ser. No. 817,961
Claims priority, application Germany, Apr. 24, 1968, 1768274
Int. Cl. C07c 47/18
U.S. Cl. 260—602 6 Claims



1. A process for the continuous preparation and recovery of hydroxypivalaldehyde which comprises:

(1) reacting isobutyraldehyde and formaldehyde in a homogeneous reaction mixture at a temperature from 30°C. to 70°C. in a first stirred vessel, said said reaction mixture being formed by introducing into said vessel an aqueous formaldehyde solution, isobutyraldehyde in a stoichiometric amount or in excess up to 100 percent, an aqueous 30 percent to 50 percent sodium hydroxide solution as a catalyst, said sodium hydroxide being present in an amount of 0.5 to 4.0 grams per mol of hydroxypivalic aldehyde produced, and an alkanol having 1 to 4 carbon atoms, said alkanol being present in an amount approximately equal in weight to the amount of water contributed by said aqueous formaldehyde solution and said aqueous sodium hydroxide solution, the ratio of the sum of the isobutyraldehyde and formaldehyde reagent to the sum of the water and alkanol being from 0.7 to 1.3;

2. introducing the reaction mixture from said first stirred vessel into at least one additional stirred vessel for further reaction at a temperature from 30°to 70°C., said additional stirred vessel being connected with said first stirred vessel in a cascade arrangement, and adding additional catalyst solution to said additional stirred vessel in the same amount as is present in said first stirred vessel;

3. distilling unreacted isobutyraldehyde from the reaction mixture, after reaction in said additional stirred vessel, as an azeotrope with said alkanol and returning the distillate to said first stirred vessel;

4. separating the undistilled residue into an aqueous phase and an organic phase in a separation zone by the addition thereto of 50 to 500 grams of isobutyraldehyde per mol of hydroxypivalaldehyde formed in the reaction;

5. distilling the organic phase to remove water and isobutyraldehyde as an azeotrope thereof and returning the isobutyraldehyde, with dissolved water therein, to the separation zone; and

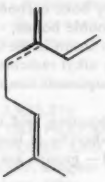
6. vacuum distilling the undistilled residue to obtain pure hydroxypivalaldehyde.

3,935,275
PROCESS FOR PREPARATION OF TERPENE FLAVORANTS AND NOVEL INTERMEDIATES THEREFOR

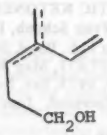
Erhard Bertele, Dubendorf, and Peter Schudel, Grut near Wetzikon, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 742,178, July 3, 1968, Pat. No. 3,872,172.
This application Jan. 25, 1974, Ser. No. 436,754
Int. Cl.² C07C 45/16
U.S. Cl. 260—603 HF 3 Claims

1. Process which comprises ozonizing a compound having the formula:

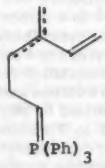


with not more than about 1 mole equivalent of ozone per mole of said compound at temperatures below ambient room temperature and decomposing the ozonization product in the presence of a reducing agent suitable for reducing ozonization products to alcohols, selected from the group consisting of a complex metal hydride, hydrogen catalytically activiated by noble-or transition metals or complexes of such said metals, to form the product having the formula:



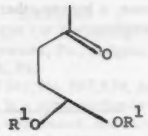
Ia

converting the alcoholic hydroxyl group to an iodo substituent, reacting the resulting iodo-compound with triphenyl phosphine to give the corresponding phosphonium iodide, neutralizing said compound to form

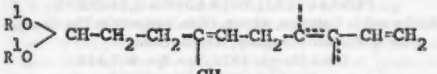


wherein Ph signifies a phenyl group,

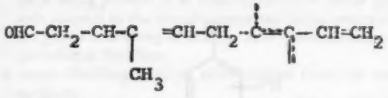
reacting the latter with the ketone acetal of the formula



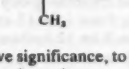
to form



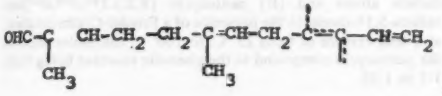
wherein R^1 signifies lower alkyl groups which may be linked together to form a lower alkylene group, hydrolyzing the resulting triene acetal which is obtained to the triene aldehyde of the formula:



and reacting the resulting triene aldehyde with a phosphorane of the general formula:



wherein Ph has the above significance, to give a corresponding tetraene aldehyde of the formula:



3,935,276

PROCESS FOR THE MANUFACTURE OF METHYL MERCAPTAN

Georges Biola, Venissieux; Bernard Buathier; André Combes, both of Lyon, and Michel Martin, Les Roches-de-Condrieu, all of France, assignors to Rhone-Poulenc Industries, Decines, France

Filed Aug. 28, 1974, Ser. No. 501,293

Claims priority, application France, Nov. 30, 1973, 73.43539

Int. Cl.² C07C *148/00*

U.S. Cl. 260—609 R 14 Claims

1. In a catalytic process for the vapor phase synthesis of methyl mercaptan by the reaction of hydrogen sulfide and methanol, the improvement comprising dividing the catalyst charge into separate portions to establish at least three catalytic zones within the catalyst bed, introducing the total theoretical amount of hydrogen sulfide into the first of said catalytic zones, introducing preselected amounts of methanol reagent into said catalytic zones wherein the molar ratio of hydrogen sulfide to methanol is between about 1.10 to 2.5 whereby the temperature in each of said catalytic zones is maintained between about 280°C. and 450°C. and recovering the methyl mercaptan product exiting from said catalyst bed.

3,935,277

NEW R_f-GLYCOLS CONTAINING TWO PERFLUOROALKYLTHIO GROUPS AND USEFUL COMPOSITIONS THEREFROM

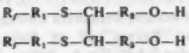
Robert Ernest Arthur Dear, Mount Kisco, and Robert Allan Falk, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,497

Int. Cl.² C07C *149/16*

U.S. Cl. 260—609 R 12 Claims

1. A compound of the formula



in which

R_f is straight or branched-chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;

R_1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, or alkyleneoxyalkylene of 2 to 12 carbon atom; and

R_2 and R_3 each independently is straight or branched chain alkylene of 1 to 12 carbon atoms; straight or branched chain alkylene of 1 to 12 carbon atoms, substituted by one or two of phenyl or cyclohexyl; or R_2 and R_3 are a group of the formula

$C_mH_{2m}(OC_kH_{2k})_r$

where

m is an integer from 1 to 12,

k is an integer from 2 to 6, and

r is an integer from 1 to 40.

3,935,278

PROCESS FOR PREPARING DIPEROXIDE FROM AN ORGANIC HYDRO-PEROXIDE AND A KETONE

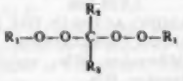
Rudolph Rosenthal, Broomall, Pa., and Harold A. Sorgenti, Olympia Fields, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 4, 1970, Ser. No. 16,564

Int. Cl.² C07C *179/02*

U.S. Cl. 260—610 R 5 Claims

1. In a method for preparing compounds of the formula



wherein R_1, R_2 and R_3 are independently selected from hydrocarbyl radicals containing from one to sixteen carbon atoms and wherein R_2 and R_3 can be joined in an alicyclic radical, by the reaction of organic hydroperoxide of the formula R_1—O—O—H with a compound of the formula

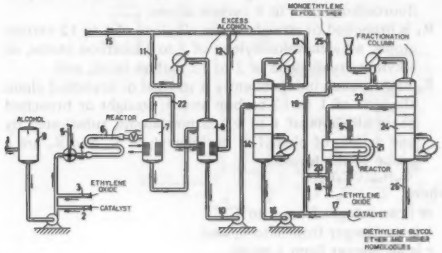
at temperatures in the range of −10°C. to 100°C., the improvement of carrying out the reaction in the presence of a catalyst concentration within the range from about 0.01 to 2 weight percent of metal based upon the total weight of the starting materials, said catalyst being molybdenum or vanadium compounds or complexes soluble in the reaction mixture.

3,935,279

PROCESS FOR THE PRODUCTION OF GLYCOL ETHERS

Gioacchino Cocuzza, Catania; Benedetto Calcagno, Milan, and Gianni Torreggiani, Varese, all of Italy, assignors to Societa'Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 26, 1973, Ser. No. 428,575
Claims priority, application Italy, Dec. 22, 1972, 33441/72
Int. Cl.² C07C *41/02*
U.S. Cl. 260—615 R **7 Claims**



1. An improved process for the production of ethylene glycol ethers by the reaction of ethylene oxide with C_1–C_4 aliphatic alcohols, wherein the improvement comprises

contacting a C_1–C_4 alkanol and ethylene oxide in a first reaction stage, under adiabotic conditions, in a molar ratio of from about 3:1 to 20:1, at a temperature of from about 70° to 220°C., at a pressure of from about 10 to 50 Kg/cm²;

evaporating excess alcohol from ethylene glycol monoalkyl ethers obtained as the reaction products in the first stage;

contacting the ethylene glycol monoalkyl ethers with ethylene oxide in a molar ratio of from about 1:1 to 10:1 and with monoethylene glycol monoalkyl ether in a second reaction stage at a temperature of from about 100° to 250°C., under isothermal conditions, at a pressure of from about 5 to 20 kg/cm²;

fractionating monoethylene glycol monoalkyl ether and diethylene glycol monoalkyl ether from the reaction products of the second stage and partly recycling the monoethylene glycol monoalkyl ether to the second stage, and discharging the remainder of the monoethylene glycol monoalkyl ether, maintaining a weight ratio of discharged fraction to the recycled fraction of from about 0.5:1 to 5:1.

3,935,280

REDUCTION OF AMINO ACIDS IN THE PRESENCE OF BORON TRIFLUORIDE

Clinton F. Lane, Milwaukee, Wis., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.

Filed Jan. 10, 1975, Ser. No. 540,007
Int. Cl.² C07C *29/00*
U.S. Cl. 260—618 H **8 Claims**

1. A process for the reduction of an amino acid to an amino alcohol which comprises contacting a mixture of the said amino acid and boron trifluoride or ether complex thereof with either diborane, a borane-ether complex or a borane-organic sulfide complex.

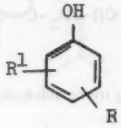
3,935,281

PHENOLIC ANTIOXIDANTS PREPARED FROM A PENTACYCLO-TETRADECA-5,11-DIENE

Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 6, 1974, Ser. No. 467,424
Int. Cl.² C07C *37/14, 39/17*
U.S. Cl. 260—619 B **5 Claims**

1. A reaction product prepared by reacting a mixture comprising (A) at least one phenolic reactant conforming to the following structural formula



wherein R is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 12 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, aralkyl radicals having from 7 to 12 carbon atoms, and aryl radicals having 6 to 12 carbon atoms and R^1 is selected from the group consisting of hydrogen and tertiary alkyl radicals having from 4 to 12 carbon atoms and (B) pentacyclo $[8.2.1.1^{4,7}.0^{2,9}.0^{3,8}]$tetradeca-5,11-diene, in the presence of a Friedel-Crafts catalyst, at a temperature of from 25° C. to 160° C. the molar ratio of the pentacyclo compound to the phenolic reactant being from 1:1 to 1:10.

3,935,282

PROCESS FOR PREPARATION OF α-NAPHTHOL

Ken-ichi Kudo, Nihama; Tadayuki Ohmae, Kobe, and Akihiko Uno, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed May 6, 1974, Ser. No. 467,541
Int. Cl.² C07C *39/14*
U.S. Cl. 260—621 H **3 Claims**

1. A process for preparing α-naphthol, which consists essentially of dehydrogenating ketotetrahydronaphthalene at a temperature of from 200 to 450°C at from atmospheric pressure to a slightly elevated pressure, in the presence of a catalyst comprising (1) platinum or a platinum compound selected from the group consisting of chloroplatinic acid and the salts thereof; (2) an alkali metal salt selected from the group consisting of sodium sulfate, sodium carbonate, sodium acetate, sodium chloride and sodium chloroplatinate; and (3) a maganese compound selected from the group consisting of maganous sulfate, manganous chloride, manganous nitrate, manganous acetate, manganic sulfate and sodium permanganate and/or a chromium compound selected from the group consisting of chromous sulfate, chromous acetate, chromic chloride, chromium trioxide and sodium bichromate; supported on a γ-alumina carrier.

3,935,283

PRODUCTION OF HYDROQUINONE

Nicholas P. Greco, Edgewood, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 267,534, June 29, 1972, Pat. No. 3,862,247, which is a continuation-in-part of Ser. No. 16,545, March 4, 1970, abandoned, and a continuation-in-part of Ser. No. 447,848, March 4, 1974, abandoned, which is a continuation of Ser. No. 296,260, Oct. 10, 1972. This application Jan. 17, 1975, Ser. No. 542,086

Int. Cl.² C07C 39/10

U.S. Cl. 260—621 M 7 Claims

1. A process for producing hydroquinone comprising:

a. hydrogenating nitrobenzene in an aqueous acid medium and in the presence of an acid resistant reducing catalyst selected from the group consisting of platinum, platinum on carbon, platinum sulfide on carbon, molybdenum sulfide on carbon and molybdenum sulfide at an elevated temperature at 130° to 160°C at an elevated pressure until hydrogen absorption by the nitrobenzene ceases; the ingredient for imparting acid characteristics to the medium being present in at least an effective molar quantity with respect to the nitrobenzene and being selected from the group consisting of sulfuric acid, phosphoric acid and ammonium bisulfate;

b. steam distilling residual nitrobenzene from the reaction medium;

c. filtering the catalyst from the reaction medium;

d. adding sufficient water to provide 40 to about 120 moles of water per mole of nitrobenzene initially present;

e. maintaining the aqueous reaction medium at a temperature of from 200 to 300°C from a time sufficient to hydrolyze the hydrogenated product to hydroquinone,

f. cooling the aqueous reaction medium, and

g. extracting the hydroquinone from said cooled aqueous reaction medium with an organic water-immiscible solvent.

3,935,284

HOMOGENEOUS HYDROGENATION OF SACCHARIDES USING RUTHENIUM TRIPHENYL PHOSPHINE COMPLEX

Walter M. Kruse, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Oct. 19, 1973, Ser. No. 407,871

Int. Cl.² C07C 29/00

U.S. Cl. 260—635 C 17 Claims

1. A homogeneous hydrogenation process comprising contacting a solution of a substrate selected from the group consisting of monosaccharides, disaccharides, trisaccharides, polysaccharides and corn starch hydrolyzate with hydrogen under positive pressure in the presence of a catalyst comprising a ruthenium triphenyl phosphine complex having the following general formula:

$$RuHCl(PR'_3)_3$$

wherein R′ is phenyl, p-methyl phenyl, or p-methoxy phenyl and a strong acid having a pKa equal to less than about 1 and a prototropic organic solvent capable of dissolving the substrate and catalyst at room temperature or at the reaction temperature and about 1 percent to about 30 percent of water based on the total weight of the system.

3,935,285

RECOVERY OF ALCOHOLS FROM ESTERS FORMED DURING AN OXO-SYNTHESIS

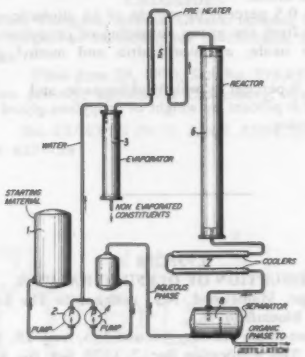
Hans Tummes, Oberhausen-Sterkrade-Nord; Jurgen Falbe, and Boy Cornils, both of Dinslaken, all of Germany, assignors to Ruhrchemie AG, Oberhausen, Germany

Continuation of Ser. No. 881,351, Dec. 2, 1969, abandoned. This application Sept. 18, 1972, Ser. No. 290,056

Claims priority, application Germany, Dec. 27, 1968, 1817051

Int. Cl.² C07C 29/00

U.S. Cl. 260—638 R 7 Claims



1. In a process for recovering an alcohol from an ester formed by the hydroformylation of an olefinically unsaturated compound with carbon monoxide and hydrogen, the improvement comprising heating the said ester with 2 to 20 % by weight water based on the combined weight of a distillation residue obtained by a distillative separation of aldehyde products from the raw product resulting from said hydroformylation, said products containing formic acid esters in admixture with alcohol and/or higher boiling condensation products from aldehydes and alcohols, at a temperature in the range of 250° to 350°C and passing the heated product in the vapor phase at ordinary atmosphereic pressure over a high surface area porous solid alumina or activated carbon maintained at said temperature and separating and recovering the resulting alcohol product from gaseous products.

3,935,286

PROCESS FOR REDUCING THE AMOUNT OF TRICHLOROETHYLENE IN 1,2-DICHLOROETHANE

Jean-Claude Strini, St-Auban, and Jean-Raymond Costes, Dampierre, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed Dec. 21, 1973, Ser. No. 427,374

Claims priority, application France, Dec. 27, 1972, 72.46391

Int. Cl.² C07C 17/38, 19/00, 21/06

U.S. Cl. 260—652 P 7 Claims

1. In the process for reducing the amount of trichloroethylene which is present as an impurity in 1,2dichloroethane through chlorination of trichloroethylene in the liquid phase into pentachloroethane at a temperature in the range from 20 to 80°C in the absence of light and in the presence of a Lewis acid catalyst the improvement wherein ethylene is introduced with chlorine and 1,2-dichloroethane containing trichloroethylene in a homogeneous reaction zone, with the mole ratio of the ethylene to trichloroethylene of at least 50 and the mole ratio of trichloroethylene to chlorine of at most 0.02.

3,935,287

STABILIZED METHYL CHLOROFORM

Norman L. Beckers, Chardon, and Edward A. Rowe, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 243,072, April 11, 1972, Pat. No. 3,864,413, which is a continuation-in-part of Ser. No. 5,101, Jan. 22, 1970, abandoned. This application Oct. 25, 1974, Ser. No. 517,941

Int. Cl.² C07C *17/40*

U.S. Cl. 260—652.5 R 3 Claims

1. A stabilized composition which consists essentially of methyl chloroform containing

a. 0.1 to 2.0 percent by weight of a nitroalkane of from 1 to 3 carbon atoms.

b. 0.05 to 0.5 percent by weight of an aliphatic epoxide selected from the group consisting of propylene oxide, butylene oxide, epichlorohydrin and methyl glycidyl ether,

c. 0.1 to 1.0 percent by weight of trioxane, and

d. 0.1 to 2.0 percent by weight of propylene glycol monomethyl ether.

3,935,288

PRODUCTION OF OLEFINIC HALIDES

Herbert Riegel, Maplewood, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 663,593, Aug. 28, 1967, abandoned. This application Dec. 2, 1970, Ser. No. 94,536

Int. Cl.² C07C *21/02*

U.S. Cl. 260—656 R 22 Claims

1. A process for producing a mono-olefinically unsaturated aliphatic hydrocarbon halide by the catalytic dehydrohalogenation of the corresponding saturated halide, comprising:

directly contacting said saturated halide with a melt containing a multivalent metal halide in its higher and lower valence state, in an amount effective to catalyze the dehydrohalogenation of the saturated halide, said multivalent metal halide being selected from the group consisting of the halides of manganese, copper, iron and cobalt, said contacting being effected at a temperature from about 300°C to about 650°C, to dehydrohalogenate the saturated halide to said monoolefinically unsaturated aliphatic hydrocarbon halide.

3,935,289

SELECTIVE HALOGENATION OF PARAFFINS

Pierre M. J. G. de Radzitzky d'Ostrowick, 101 Avenue Paul Hymans - Woluwe-St-Lambert; Jacques D. V. Hanotier, 36 Avenue Docteur Decroly - uccle., 18 Brussels, and Joseph M. E. Vaerman, 28, Clos Fernand Tonnet, 9 Jette - Brussels, all of Belgium

Filed Dec. 11, 1969, Ser. No. 884,317

Claims priority, application Belgium, Apr. 11, 1969, 69601

Int. Cl.² C07C *109/04*

U.S. Cl. 260—660 12 Claims

1. The process for selective halogenation of a straight-chain or branched-chain hydrocarbon of the type CH_3-CH_2-R in which R is a primary alkyl group, to preferentially halogenate the carbon atom of a methylene group in alpha-position to a terminal methyl group, comprising reacting said hydrocarbon in the liquid phase with a halogen donor selected from the group consisting of molecular bromine and the halogen compounds having the formula

wherein X is a chloro or bromo radical; Y_1 and Y_2 are members of the group consisting of the fluoro, chloro, bromo, cyano, carboxyl, alkoxycarbonyl, hydrogen and hydrocarbon radicals; Y_3 is a fluoro, chloro, bromo, cyano, carboxyl, or alkoxycarbonyl radical; in the presence of a cationic cobaltic salt of a lower fatty acid and an activator selected from the group consisting of sulphuric acid, perchloric acid, trifluoroacetic acid, trichloroacetic acid, tribromoacetic acid, dichloroacetic acid, dibromoacetic acid, boron trifluoride and mixtures thereof, at a temperature between −20°C and +100°C, and in the absence of molecular oxygen.

3,935,290

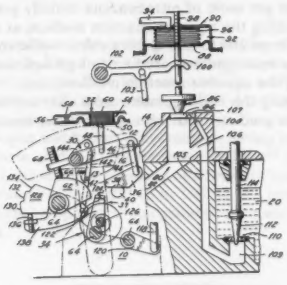
CARBURETOR COLD ENGINE FUEL ENRICHMENT SYSTEM

William E. Dickensheets, and Albert A. Pruchno, both of Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1974, Ser. No. 491,597

Int. Cl.² F02M *1/06*

U.S. Cl. 261—39 B 7 Claims



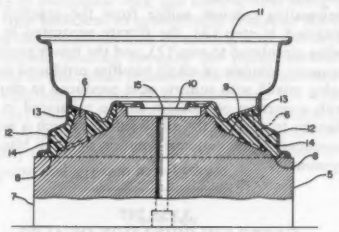
1. A combination cold engine cranking and running fuel enrichment system comprising a variable area venturi carburetor having an induction passage connected to fresh air at one end and adapted to be connected to the engine intake manifold at the other end, the passage containing means forming a venturi including a valve movable to vary the venturi area to control airflow through the venturi, a variable area fuel port adjacent the venturi whereby fuel is inducted into the passage during airflow through the venturi, an auxiliary air bypass passage having an outlet connected to the induction passage and having a separate air inlet, a first valve spring biased to close the inlet and responsive to engine operation to move to an open position, a supplemental fuel passage connected to the air bypass passage at one end to a supply of fuel at the other end, a second valve movably cooperating with the fuel supply to block or variably increase the supply of fuel to the supplemental fuel passage, temperature responsive means connected to the second valve for movement of the second valve in opposite directions as a function of changes in temperature from a predetermined level, and control means to vary the area of both the venturi and fuel port on a predetermined schedule to vary fuel flow and normally biasing the venturi valve towards a closed smallest area venturi position and movable in response to engine operation to open positions increasing the area of the venturi anc changing fuel flow, inoperativeness of the engine effecting a movement of the venturi valve to effect closing down of the venturi area and a closing of the first valve to decrease the air supplies to the induction passage and bypass passage upon subsequent engine

cranking operation thereby increasing the manifold signal acting on the supplemental fuel passage to enrichen the starting fuel/air mixture to the engine, subsequent running operation of the engine moving the venturi valve to a larger venturi area and the first valve to an open position thereby increasing the fuel inducted from the fuel port while bleeding the manifold signal acting on the fuel passage to decrease fuel flow through the fuel passage and leaning the fuel/air mixture to the engine to provide an overall fuel/air mixture leaner than during engine cranking operations, means connecting an air bleed passage to the supplemental fuel passage and having an orifice therein, the first valve in its closed position covering the air bleed passage, opening of the first valve decaying the vacuum signal acting on the fuel passage.

3,935,291
METHOD OF MOLDING POLYURETHANE ARTICLES IN A MOLD COATED WITH THREE MOLD RELEASE AGENTS

William E. Jackson, Bradner, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 28, 1973, Ser. No. 392,400
Int. Cl.² B29C *1/04*, *5/00*; B29D *27/04*
U.S. Cl. 264—331 5 Claims



1. In a method of molding polyurethane articles from a polyurethane reaction mixture by applying mold release agent to the mold, charging a polyurethane reaction mixture into the mold and permitting said reaction mixture to react and set prior to removal from the mold, the improvement wherein the mold release coatings comprises a coating of a polyhalocarbon a hydrocarbon mold release agent selected from the class consisting of wax, polyethylene and polypropylene and a coating over the hydrocarbon mold release agent of polyvinyl alcohol.

3,935,292
CAST POLYMERIZATION PROCESS WITH IMPROVED MOLD RELEASE

Hiroshi Okubo; Masamichi Kato; Isao Kaetsu, and Akihiko Ito, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 20, 1974, Ser. No. 453,044
Claims priority, application Japan, Mar. 23, 1973, 48-32605
Int. Cl.² B29C *1/04*
U.S. Cl. 264—338 6 Claims

1. A process for producing a cast polymer article using a mold with a glass surface, comprising:

coating the glass surface of the mold with polysiloxane or silicone oil;

heating the polysiloxane or silicone oil coating on the surface at a temperature in the range of from about 150°C to about 350°C at which the percent gel fraction of the baked polysiloxane or silicone oil determined by extracting in toluene at 60°C for 48 hours is at the most 50 percent;

wiping the coated and baked polysiloxane or silicone oil to remove excess polysiloxane or silicone oil to thus smoothen the coating;

charging a material to be cast selected from the group consisting of a polymerizable monomer, a polymerizable prepolymer or a mixture thereof into the treated mold as above;

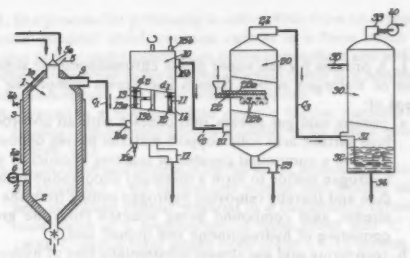
polymerizing the material by a suitable polymerization means; and

removing the resulting cast article from the mold.

3,935,293
METHOD FOR THE MANUFACTURE OF METALLIC CHLORIDES

Constantin Tsirigotis, Athens, Greece, assignor to Larco Societe Miniere et Metallurgique de Larymna S.A., Athens, Greece

Filed June 29, 1973, Ser. No. 375,093
Claims priority, application Luxemburg, Mar. 6, 1973, 67161
Int. Cl.² C01G *49/10*, *53/08*, *37/04*, *3/04*
U.S. Cl. 423—39 13 Claims



4. In a method for the manufacture of metallic chlorides comprising:

providing a raw material containing as an alloy at least two metals selected from the group consisting of iron, nickel, chromium, copper and cobalt,

said raw material optionally containing sulfur, the amount of said metals, together with any sulfur present in said raw material, being more than 80 percent by weight of the raw material, said raw material being in the form of ingots, scrap metal, or mats, in pieces less than 200 mm in size,

providing a chlorinating zone containing a gaseous chlorinating mixture containing chlorine, HCl, and oxygen, the partial pressures of these constituents being as follows:

$2P_{Cl_2} + P_{HCl} \cdot 0.2$ atmosphere, and

$P_{O_2} < P_{HCl} + P_{Cl_2}$,

introducing said raw material into said chlorinating zone,

maintaining the temperature in said chlorinating zone at a temperature of from 600°C to 1350°C, and maintaining said partial pressures of said chlorinating constituents, to chlorinate at least two said metals to form at least two gaseous metal chlorides,

reducing the vapor pressure of said gaseous metal chlorides sufficiently to recover at least one of said metal chlorides as a liquid or solid metal chloride, and

recovering the condensed metal chloride,

the improvement which comprises

maintaining, in the chlorination zone, the amount of chlorine at more than 5 volume % and less than 90 volume %, the amount of HCl at more than 1 volume % and less than 75 volume %, and the amount of oxygen at more than 1 volume % and less than 35 volume %.

3,935,294

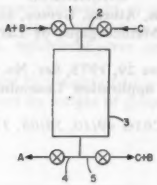
METHOD OF REMOVING HYDROGEN SULFIDE FROM GASES

Aaron J. Teller, Great Neck, N.Y., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Division of Ser. No. 156,952, June 25, 1971, Pat. No. 3,859,417, which is a continuation of Ser. No. 860,665, Sept. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 667,801, Sept. 14, 1967, abandoned, which is a continuation-in-part of Ser. No. 363,403, April 29, 1964, abandoned. This application June 14, 1974, Ser. No. 479,212

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—226 8 Claims



1. A process for the vapor phase chromatographic separation of hydrogen sulfide from a gas stream comprising the steps of:

a. passing said gas stream into contact with an absorbent, high surface area solid support material having deposited thereon a compound capable of reacting chemically with hydrogen sulfide to form a thermally decomposible molecule and thereby removing hydrogen sulfide from the gas stream, said compound being selected from the group consisting of hydroquinone and quinol; and,

b. recovering said gas stream substantially free of hydrogen sulfide by removing it from contact with the support material and the thermally decomposible molecule deposited thereon.

3,935,295

PROCESS FOR REMOVING CHLORINE-CONTAINING COMPOUNDS FROM HYDROCARBON STREAMS

Richard W. La Hue, and Cecil B. Hogg, both of Louisville, Ky., assignors to Catalysts and Chemicals, Inc., Louisville, Ky.

Filed Jan. 23, 1973, Ser. No. 326,011

Int. Cl.[2] C01B *7/00*

U.S. Cl. 423—240 7 Claims

6. A process of removing organic sulfur compounds and organic chloride compounds from a hydrocarbon containing fluid stream, which comprises the steps of:

A. converting said organic sulfur compounds to hydrogen sulfide and said organic chloride compounds to hydrogen chloride by passing said fluid stream in the presence of hydrogen over a catalyst comprising cobalt or nickel in association with the oxides of molybdenum and a support at a pressure in excess of atmospheric and a temperature in excess of 300° F.;

B. removing the hydrogen chloride and a portion of said hydrogen sulfide by passing said treated fluid stream at a temperature in excess of 300° F. through a bed of solid chloride adsorbent comprising a mixture of zinc oxide, a basic compound of calcium and an inert binder, said basic compound of calcium being present in a weight percent, expressed as calcium oxide, of from 10 to 80 percent of the total adsorbent; and,

C. removing the remainder of said hydrogen sulfide from said fluid by passing said fluid through an adsorbent active for removing hydrogen sulfide therefrom.

3,935,296

METHOD FOR REMOVING SULFUR DIOXIDE FROM A COMBUSTION EXHAUST GAS

Tomijiro Morita, and Isao Funahashi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1973, Ser. No. 413,906

Claims priority, application Japan, Nov. 10, 1972, 47-112656

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 4 Claims

1. A method for removing sulfur dioxide in the form of calcium sulfite from a sulfur dioxide-containing combustion exhaust gas, comprising the steps of:

1. feeding a portion of the combustion exhaust gas to a sulfuric acid solution to produce sulfurous acid in the solution and a gas exhaust and then oxidizing the sulfurous acid with air or oxygen in the presence of an oxidizing catalyst to produce sulfuric acid;

2. feeding the remaining portion of the combustion exhaust gas and the gas exhausted from step (1) to an aqueous solution of alkali sulfite to produce an aqueous solution of alkali bisulfite and alkali sulfate;

3. mixing a major portion of the aqueous solution of alkali bisulfite produced in step (2) with slaked lime or limestone for reaction to give a reaction solution containing calcium sulfite; and

4. separating calcium sulfite from the reaction solution obtained in step (3), the filtrate separated in step (4) being circulated to step (2), and the minor portion of the aqueous solution of alkali bisulfite produced in step (2) being mixed with sulfuric acid produced in step (1) and with a portion of calcium sulfite separated in step (4) thereby to convert the alkali sulfate, which is secondarily produced in the aqueous solution of alkali bisulfite, into gypsum.

3,935,297

CARBO CHLORINATION OF $ALPO_4$

Alfred Lippman, Metairie; Charles Toth, New Orleans, and Roger Frank Sebenik, Matairie, all of La., assignors to Toth Aluminum Corporation, New Orleans, La.

Filed Dec. 19, 1973, Ser. No. 426,218

Int. Cl.[2] C01B *25/12*; C01F *7/02*

U.S. Cl. 423—304 11 Claims

1. A process of anhydrous carbo-chlorination of $AlPO_4$ comprising the steps of introducing $AlPO_4$-containing material into a reactor zone; introducing chlorine and carbonaceous material into said reactor zone; heating the reactor zone to a temperature of from 600°–1200°C to form aluminum chlorides, phosphorous oxides, phosphorous chlorides, phosphorous oxychlorides and carbon oxides; separating the reaction products into three fractions by condensation, the first fraction being P_2O_5, the second fraction being $AlCl_3$ and $AlCl_3 \cdot POCl_3$, and the third fraction being PCl_3, PCl_5, P_2O_3, CO and CO_2; and passing said fraction, which is gaseous, into an oxidizer to produce P_2O_5, CO_2 and Cl_2.

3,935,298

PROCESS FOR THE PREPARATION OF PHOSPHORIC ACID

Yujiro Sugahara, Tokyo; Yoshibumi Noshi, Tsuruoka; Hiroyuki Naito, Tsuruoka; Akira Takahashi, Tsuruoka, and Shoji Shoji, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 2, 1973, Ser. No. 375,828

Claims priority, application Japan, Nov. 25, 1972, 47-118341

Int. Cl.[2] C01B *25/16*

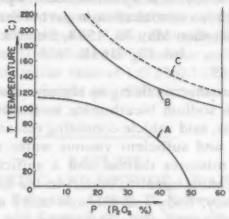
U.S. Cl. 423—320 19 Claims

1. In a process for the preparation of phosphoric acid which comprises mixing phosphate rock and sulfuric acid in the presence of water, drying the mixture to obtain a solid reac-

tion product between phosphate rock and sulfuric acid and extracting phosphoric acid from said solid reaction product, the improvement which comprises mixing phosphate rock and sulfuric acid in an amount of 0.7 to 0.97 equivalent to the calcium component in the phosphate rock, in the presence of water at a temperature of 30° to 105°C., under such condition that gypsum dihydrate is stably formed and that the following requirement is satisfied:

$$0.70 \geqq C \geqq 0.45$$

wherein C designates the weight ratio of phosphate rock to the sum of phosphate rock and total water,



the mixing of phosphate rock and sulfuric acid being carried out for a time sufficient to substantially complete the decomposition of the phosphate rock by sulfuric acid, and drying the mixing reaction product between the phosphate rock and sulfuric acid to solid small masses of the phosphate rock-sulfuric acid reaction product at a temperature not exceeding 200°C. under such drying time and heating conditions that the gypsum dihydrate in said mixing reaction product is converted substantially to anhydrous gypsum or a combination of anhydrous gypsum and gypsum hemihydrate.

3,935,299
PROCESS FOR PREPARATION OF WIDE-PORE ADSORBENT FOR USE IN CHROMATOGRAPHY

Andrei Vladimirovich Kiselev, Leninskie Gory, Mgu Zona M kv. 160, Moscow; Galina Lvovna Kustova, ulitsa Burevestnika 9, kv. 9; Boris Alexandrovich Lipkind, ulitsa Burevestnika, 9, kv. 3, both of Gorky, and Jury Stepanovich Nikitin, Leningradskoe shosse, 120, korpus 3, kv. 4, Moscow, all of U.S.S.R.

Continuation of Ser. No. 252,462, May 11, 1972, Pat. No. 3,888,972. This application Jan. 31, 1975, Ser. No. 546,184

Int. Cl.² C01B *33/12, 33/16, 33/18*

U.S. Cl. 423—338 **3 Claims**

1. A process of preparing a porous silica adsorbent having a pore diameter of 560 to 19,500 A adapted for use in chromatography comprising the steps of (1) mixing finely dispersed non-porous silica having a specific surface area of 35 to 380 m^2/g with water to form an aqueous suspension; (2) drying the suspension at a temperature of 100° to 450°C. to form a silica xerogel; (3) hydrothermally treating said dried xerogel at a temperature of 100° to 380°C and under a pressure of 1 to 300 atm; (4) drying the treated xerogel at a temperature of 100° to 300°C.; and particulating the dried xerogel by grinding either after step (2) or after step (4).

3,935,300
PROCESS FOR PREPARING POTASSIUM CYANATE FROM POTASSIUM HYDROXIDE AND UREA

Gerald L. Tucker, and Elmer Ladelle Blanton, both of Yazoo City, Miss., assignors to Mississippi Chemical Corporation, Yazoo City, Miss.

Filed Feb. 20, 1974, Ser. No. 444,011

Int. Cl.² C01C *3/14*

U.S. Cl. 423—365 **4 Claims**

1. In a process for preparing potassium cyanate by the melt reaction of urea with potassium hydroxide and recovering the resulting potassium cyanate, the improvement which comprises:

mixing solid urea and solid potassium hydroxide in a mole ratio of 1.75 to 2.15 : 1.0; and

heating said mixture until it melts and resolidifies to 180° – 240°C and reaction byproducts are no longer evolved.

3,935,301
PROCESS FOR PRODUCING CARBON FIBERS FROM ORGANIC FIBROUS MATERIAL

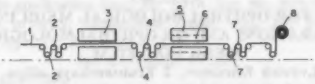
Ken-ichi Morita; Yoshiro Kinoshita, and Shigetora Kashio, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 29, 1973, Ser. No. 364,752

Claims priority, application Japan, Aug. 7, 1972, 47-78410, June 1, 1972, 47–53827

Int. Cl.² B29C *25/00*

U.S. Cl. 423—447 **14 Claims**



1. In a process for producing a carbon fiber from an organic fibrous material which contains carbon in a form which is subject to heat stabilization in an active atmosphere and which carbon is operative to form strong carbon fibers in a non-oxidizing atmosphere, the steps which comprise:

A. preparing a heat-stabilized organic fibrous material by heating said organic fibrous material in an active atmosphere, and

B. conduction said fibrous material under tension at a speed of about 0.5 – 65 meters per minute and heating said heat-stabilized fibrous material in a carbonizing furnace maintained at a temperature of from about 800° C to 1600° C over a total length from about 1 – 15 meters,

B-1. controlling said heating in said furnace to provide a profile of such character that when temperature is plotted on a vertical axis and locations along the length of the carbonizing furnace are plotted on the horizontal axis, the temperature profile above 800° C has a slope which either remains constant or decreases until the maximum temperature in said furnace is reached,

B-2. said heating being further characterized by the fact that, when said temperature profile is divided vertically midway along the length of said furnace to form halves representing the inlet portion and the outlet portion of said furnace, the area under the plot corresponding to the outlet portion of said furnace is greater than that representing the inlet portion of said furnace, and wherein

B-3. the average cooling rate in said furnace is greater than the average heating rate, and wherein

B-4. the maximum furnace temperature exists at the aforementioned outlet portion of said furnace.

3,935,302
PREPARATION OF ALKALINE EARTH METAL HALIDE CRYSTALS FOR LASER WINDOWS

Ricardo C. Pastor, Manhattan Beach; Kaneto Arita, Gardena, and Morton Robinson, Malibu, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 27, 1974, Ser. No. 446,581

Int. Cl.² C01F *11/22*

U.S. Cl. 423—490 **4 Claims**

1. A method of preparing alkaline earth metal halide crystals for laser windows by a reactive atmosphere process comprising the steps of

a. placing an alkaline earth metal halide crystal in a crystal growth crucible within a furnace;

b. purging said furnace with an inert gas;
c. causing the atmosphere within said purged furnace to become reactive with respect to anion and cation impurities by the application of low dewpoint HF gas at an input rate which maintains a positive pressure at a P_{H_2O}/P_{HF} ratio less than 10^{-5};
d. causing said halide crystal to melt by gradually increasing the temperature of said furnace to a point slightly above the melting point of said crystal;
e. allowing said melt to soak in said reactive atmosphere from 8–15 hours;
f. initiating a programmed crystal growth process with said crucible at a rate not to exceed a few millimeters per hour whereby a recrystallized crystal is formed; and
g. allowing said crystal to slowly cool in the presence of the HF reactive atmosphere.

3,935,303
BASE FOR OPHTHALMOLOGICAL MEDICINAL PREPARATIONS AND ON OPHTHALMOLOGICAL MEDICINAL FILM

Gennady Lvovich Khromov, 2 Frunzenskaya ulitsa, 10, kv. 100; Anatoly Borisovich Davydov, ulitsa Krasny Kazanets, 19, korpus 1, kv. 283; Jury Fedorovich Maichuk, ulitsa Usievicha, 11, kv. 4, all of Moscow, and Inna Fedorovna Tischina, Schelkovsky raion, poselok Biofabriki, 25, kv, 22, Moskovskaya oblast, all of U.S.S.R.

Filed Nov. 1, 1972, Ser. No. 302,820
Int. Cl.² A61K 27/12
U.S. Cl. 424—14 **5 Claims**

1. An ophthalmological medicinal film which is an oblong plate, 6 – 9 mm long, 3 – 5 mm wide, and 0.2 – 0.6 mm thick consisting of a biologically soluble, assimilable copolymer of acrylamide, N-vinylpyrrolidone and butyl acrylate having a molecular weight from 20,000 to 500,000 and containing 10 to 90 per cent acrylamide links and an ophthalmological medicinal agent, selected from the group consisting of 3-ethyl-4(1-methyl-5-imidazolyl)- tetrahydrofuran-2-one, atropine, 3-methoxy-6-sulfanilamidopyridazine, β-dimethylaminoethyl-p-butylaminobenzoate, neamine and 5-iodo-2-desoxyuridine, said film characterized by prolonged medicinal action in the eye.

3,935,304
DENTAL CREAMS

Joseph P. Januszewski, Sommerville; Martin Cordon, Highland Park, and William Grant Pierson, Flanders, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 295,073, Oct. 4, 1972, abandoned. This application Apr. 30, 1974, Ser. No. 465,462
Int. Cl.² A61K 7/16
U.S. Cl. 424—49 **15 Claims**

1. A toothpaste containing at least about 25% by weight dispersed particles of sodium bicarbonate and a polishing agent system comprising titanium dioxide powder having a particle size less than about two microns, the amount of titanium dioxide particles being more than about 0.1% of the weight of the toothpaste, said particles dispersed in a vehicle containing sufficient liquids, said vehicle consisting essentially of about 5 to 35% water and sufficient viscous water miscible polyol humectant or mixtures thereof, and a sufficient amount of gelling or thickening agent to impart to the toothpaste the pasty consistency, body and the non-tacky nature which is characteristic of conventional dental creams or toothpastes, said sodium bicarbonate being primarily in an undissolved solid state, said dental cream having a granular textured appearance comprising a substantially dispersed non-crystalline appearing granulate of macroscopic crystalline bicarbonate granules in an otherwise smooth continuous matrix.

3,935,305
TOOTHPASTE

Thomas James Delaney, Piscataway, and William Grant Pierson, Flanders, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. Nos. 465,461, April 30, 1974, and Ser. No. 465,476, April 30, 1974, and Ser. No. 465,463, April 30, 1974, which is a continuation-in-part of Ser. No. 419,741, Nov. 28, 1973, which is a continuation-in-part of Ser. No. 389,827, Aug. 20, 1973, abandoned, and Ser. No. 295,094, Oct. 4, 1972, abandoned, said Ser. No. 465,461, is a continuation of Ser. No. 295,068, Oct. 4, 1972, abandoned, said Ser. No. 468,476, is a continuation-in-part of Ser. No. 382,827, , which is a continuation-in-part of Ser. No. 295,094,
This application May 30, 1974, Ser. No. 474,551
Int. Cl.² H61K 7/18
U.S. Cl. 424—49 **16 Claims**

1. A dental cream containing an abrasive system comprising about 1 – 25% sodium bicarbonate in a vehicle containing sufficient liquids, said vehicle consisting essentially of about 5 to 35% water and sufficient viscous water miscible polyol humectant or mixtures thereof and a sufficient amount of gelling or thickening agent to impart to the dental cream the pasty consistency, body and the non-tacky nature which is characteristic of conventional dental creams or toothpastes, and at least about 20% of a water-insoluble dental abrasive material compatible with said bicarbonate in the dental cream, said sodium bicarbonate being primarily in the undissolved solid state, said dental cream having a granular textured appearance comprising dispersed non-crystalline appearing granulate of macroscopic crystalline bicarbonate granules in an otherwise smooth continuous matrix.

3,935,306
TOOTHPASTE FORMULATIONS

Francis D. Roberts, Millinton, N.J., and John J. Steinke, III, Syracuse, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 243,060, April 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 147,613, May 27, 1971, abandoned, which is a continuation of Ser. No. 749,934, Sept. 5, 1968, abandoned. This application Feb. 8, 1974, Ser. No. 440,945
Int. Cl.² A61K 7/16
U.S. Cl. 424—49 **13 Claims**

1. A speckled toothpaste comprising a translucent or transparent gel toothpaste vehicle having a refractive index between 1.4 and 1.5 and having dispersed therein up to 75% by weight of macroscopically visible, substantially water-insoluble palpable agglomerates of impalpable dental polishing agent particles, said agglomerates having a particle size less than 840 microns and including an agglomerating agent having binding properties, said particles of dental polishing agent being so agglomerated that said agglomerates retain their visibility and palpability in the toothpaste but are reduced to invisible, impalpable particles when said toothpaste is subjected to toothbrushing, said toothpaste base including a polishing material having a refractive index substantially the same as said translucent or transparent toothpaste vehicle in order to maintain visual clarity so as to form a clear gel, the total amount of dental polishing agent and polishing material in said toothpaste being at least 5 percent by weight, said agglomerates being visible both on the surface and in the interior of said clear gel, giving a positive three dimensional sparkling appearance due to the unique light reflectance effects, said agglomerates being inherently white or, when colored, containing about 1 to 10% by weight of water insoluble dye, pigment or lake, said clear gel vehicle having a color different from, or contrasting with, said agglomerates, said gel vehicle containing water and having a total liquid content which is about 20 to 89.5% by weight of the toothpaste.

3,935,307
LIQUID OR PASTY DENTIFRICE AND PROCESS FOR PREPARING THE SAME

Kenji Aimoto, Toyonaka; Shigeru Hashimoto, Suita, and Toyoaki Yoneda, Sakura, all of Japan, assignors to Teijin Limited, Osaka and Sunstor Dentrificy Co. Ltd., both of, Japan

Filed May 30, 1974, Ser. No. 474,721
Claims priority, application Japan, June 5, 1973, 48-62504
Int. Cl.² A61K 7/16
U.S. Cl. 424—56 6 Claims

1. In a liquid or pasty dentifrice, the improvement which comprises uniformly incorporating therein, a first polysaccharide having a number average molecular weight of not less than 100,000, the molecule of said first polysaccharide containing D-glucose, D-mannose, D-galactose and succinic acid in the approximate molar ratio of 1:0.03:0.1:0.2, in an amount of 0.3 to 2 parts by weight per 100 parts by weight of said liquid or pasty dentifrice.

3,935,308
WOUND COVERING AND METHOD OF APPLICATION

Donald L. Wise, Belmont; Arthur D. Schwope, Watertown, both of Mass., and Kenneth W. Sell, Rockville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 8, 1974, Ser. No. 495,705
Int. Cl.² A61K 31/74
U.S. Cl. 424—78 1 Claim

1. A method of treating an extensive burn injury to an external portion of a person, comprising the steps of:

spraying a layer of a solution of poly-ε-caprolactone, having a molecular weight in the range of 2,000 to 300,000, in a volatile solvent comprising liquid tetrahydrofuran onto said external portion;

allowing said solvent to evaporate so as to leave a thin, flexible film of said poly-ε-caprolactone, having a thickness of about 0.0005 inch to 0.01 inch, adhering to said portion so as to form a barrier to body fluid loss therethrough.

3,935,309
SYNERGISTIC COMBINATIONS OF PHOSPHONOMYCIN AND BACTERIOSTATIC AGENTS

David Hendlin, Springfield, N.J.; Justo Martinez Mata; Sagrario Mochales Del Val, both of Madrid, Spain, and Edward O. Stapley, Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. Nos. 655,757, July 25, 1967, abandoned, and Ser. No. 679,165, Oct. 20, 1967, abandoned, Ser. No. 728,059, May 9, 1968, Pat. No. 3,639,590, and Ser. No. 59,761, July 30, 1970, abandoned, and Ser. No. 255,117, May 19, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,846
Int. Cl.² A61K 35/00
U.S. Cl. 424—114 6 Claims

5. The method of treating infections caused by pathogenic bacteria in animals and humans which comprises administering to animals or humans a composition comprising phosphonomycin and chloramphenicol in an effective amount for treating said pathogen, said phosphonomycin and chloramphenicol being administered in the ratio of 1–10 to 10–1.

3,935,310
REMEDY FOR TREATMENT OF HEMORRHOIDS

John D. Homan, 115 Gilbert Ave., Ada, Ohio 45810

Continuation-in-part of Ser. No. 448,820, March 7, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,632
Int. Cl.² A61K 35/78
U.S. Cl. 424—195 6 Claims

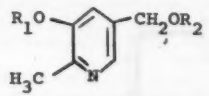
1. Composition for the treatment of hemorrhoids consisting essentially in the product resulting from heating powdered or chipped limbs or roots of *Celastrus scandens* to a temperature not substantially exceeding 240°F, for a period of 2–15 minutes, in a medium selected from the group consisting of animal fats and vegetable oils.

3,935,311
SUBSTITUTE PYRIDINOL-CONTAINING COMPOSITIONS AND METHODS FOR THE TREATMENT OF COCCIDIOSIS

Yasuhiro Morisawa; Mitsuru Katsoka; Taiichiro Watanabe; Noritoshi Kitano, and Toshiaki Matsuzawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 404,641, Oct. 9, 1973, Pat. No. 3,897,556. This application Sept. 26, 1974, Ser. No. 509,720
Claims priority, application Japan, Oct. 20, 1972, 47-105090; Apr. 11, 1973, 48-41111
Int. Cl.² A61K 31/675
U.S. Cl. 424—200 9 Claims

1. An anticoccidial composition which comprises a compound of the formula



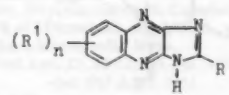
intimately dispersed in an inert edible carrier, wherein R_1 and R_2 are each hydrogen or a phosphono group, and at least R_1 or R_2 is said phosphono group; or a salt thereof.

3,935,312
COMBATING FUNGI WITH IMIDAZO-[4,5-b]QUINOXALINES

Winfried Lunkenheimer; Karl Heinz Büchel, both of Wuppertal, and Helmut Kaspers, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 21, 1973, Ser. No. 399,652
Claims priority, application Germany, Oct. 7, 1972, 2249350
Int. Cl.² A01N 9/22
U.S. Cl. 424—250 7 Claims

1. A method of combating parasitary fungi which attack plants which comprises applying to said fungi a fungicidally effective amount of an imidazo[4,5-b]quinoxaline of the formula



in which

R is alkyl with 1 to 4 carbon atoms or haloalkyl with 1 to 2 carbon atoms and 2 to 5 halogen atoms,

R^1 is chlorine, alkyl with 1 to 4 carbon atoms or haloalkyl with 1 to 2 carbon atoms and 2 to 5 halogen atoms, and

n is 0, 1 or 2.

3,935,313

PHARMACEUTICAL COMPOSITION CONTAINING N-(3-DIETHYL-AMINOPROPYL)-4-NITRO-1-OXIDE-PYRIDINE-2-CARBOXAMIDE AND PROCESS FOR THE TREATMENT OF HYPERTENSION THEREWITH

Jan Marcel Didier Aron-Samuel, Suresnes, and Jean Jacques Sterne, Argenteuil, both of France, assignors to Jan Marcel Didier Aron-Samuel, Suresnes, France

Continuation-in-part of Ser. No. 233,718, March 10, 1972, abandoned. This application May 29, 1974, Ser. No. 474,316
Claims priority, application United Kingdom, Mar. 29, 1971, 8084/71
Int. Cl.² A61K *31/455*, *31/44*
U.S. Cl. 424—266 11 Claims

1. Process for the treatment of hypertension, comprising administering to a patient suffering from hypertension a therapeutically effective amount of a compound selected from the group consisting of N-(3-diethylaminopropyl)-4-nitro-1-oxide-pyridine-2-carboxamide and its acid addition salt with a pharmaceutically acceptable acid.

4. Pharmaceutical composition having an anti-hypertensive activity comprising a therapeutically effective amount of a compound selected from the group consisting of N-(3-diethylamino-propyl)-4-nitro-1-oxide-pyridine-2-carboxamide and its acid addition salt with a pharmaceutically acceptable acid together with a pharmaceutical carrier.

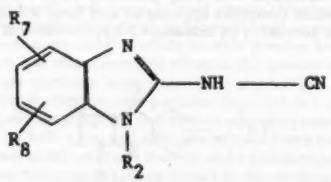
3,935,314

ANTI-HYPERTENSIVE COMPOSITIONS OF BENZIMIDAZOLE DERIVATIVES

Eric Alfred Watts, Harlow, England, assignor to Beecham Group Limited, England

Continuation of Ser. No. 308,719, Nov. 22, 1972, abandoned.
Claim priority, application United Kingdom, 54498/71
This application Oct. 2, 1974, Ser. No. 511,227
Int. Cl.² A61K *31/415*
U.S. Cl. 424—273 14 Claims

14. A method of treatment of hypertension in a mammal which comprises the administration to said mammal of an anti-hypertensively effective amount of a composition comprising an anti-hypertensively effective amount of a compound of the formula:



or a pharmaceutically acceptable salt thereof wherein R_2 is hydrogen or methyl and each of R_7 and R_8 is hydrogen, chlorine, bromine or methyl together with a pharmaceutically acceptable carrier, wherein the composition is in oral dosage form containing from 5 to 500 mgs of anti-hypertensive compound.

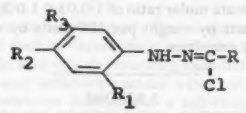
3,935,315

INSECTICIDAL AND ACARICIDAL PHENYLHYDRAZONE DERIVATIVES

Roger Boesch, Vitry-sur-Seine, France, assignor to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 363,651, May 24, 1973, Pat. No. 3,847,987. This application Apr. 25, 1974, Ser. No. 464,213
Claims priority, application France, May 26, 1972, 72.18895; Mar. 19, 1973, 73.09754
Int. Cl.² A01N *9/20*
U.S. Cl. 424—327 13 Claims

1. An insecticidal and acaricidal composition suitable for agricultural use containing 0.005 to 80% by weight of a phenylhydrazone derivative of the formula:



wherein R represents alkyl of 1 through 4 carbon atoms, and two of the symbols R_1, R_2 and R_3 represent halogen and the third represents halogen or nitro, and a compatible diluent therefor.

3,935,316

METHOD OF USE AND FORMULATIONS

Malcolm W. Moon, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 2, 1975, Ser. No. 537,836
Int. Cl.² A61K *31/15*
U.S. Cl. 424—327 7 Claims

1. The method for therapeutically and prophylactically controlling parasitic Haemonchus or Ostertagia worms in animals which comprises administering orally or parenterally to animals an effective anthelmintic dosage of 3-phenylpyruvoyl chloride 1-phenylhydrazone.

3,935,317

PREPARATION OF RED AND ROSE WINES

Joseph S. Bianchi, 551 Miguel Place, Fullerton, Calif. 92635

Filed May 30, 1974, Ser. No. 474,523
Int. Cl.² C12G *1/00*
U.S. Cl. 426—15 10 Claims

1. A fermentation process for making wine from grapes having colored skins, which process includes the steps of:

a. de-stemming and crushing said grapes;
b. pressing said de-stemmed and crushed grapes to separate the juice and pulp from the skins thereof;
c. disposing said juice and pulp in a container in which they are in free communication with the ambient atmosphere;
d. adding yeast to said juice and pulp to cause the fermentation thereof;
e. subjecting said skins to the action of an aqueous mixture of citric acid and an acid selected from the group consisting of hydrochloric, sulfuric and phosphoric acids until a substantial amount of the coloring substance has been withdrawn from said skins and colors said aqueous mixture to provide an aqueous colored extract and thereafter separating said colored extract from said skins;
f. partially neutralizing said colored extract by neutralizing said acid from said group therein with a non-toxic material;
g. allowing said yeast to ferment said juice and pulp to wine, with carbon dioxide and exothermic heat generated by said fermentation being allowed to flow to the ambient atmosphere; and

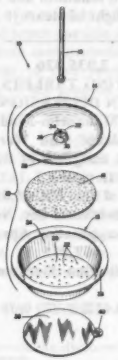
h. adding said colored partially neutralized aqueous extract to said juice and pulp prior to the fermentation thereof to wine having been completed by said yeast.

3,935,318

DISPOSABLE APPARATUS FOR BREWING A BEVERAGE SUCH AS COFFEE

Sergio Mihailide, Alabama 41 - Apt. 101, Colonia Napoles ZP18, Mexico City, Mexico

Filed Oct. 12, 1974, Ser. No. 512,876
Int. Cl.² B65B 29/02
U.S. Cl. 426—80 16 Claims



1. Disposable device for use with a cup of hot water for brewing a single cup of a beverage, comprising: a receptacle containing a predetermined quantity of ground beverage material selected from the group consisting of coffee and tea, said receptacle having a circular horizontal cross-section and a height that is less than the diameter of said cross-section, said receptacle including an annular side portion non-permeable to water a lid that is flexible for vertical reciprocating action and non-permeable to water and a bottom surface that is permeable to water, and manual pumping means flexing only the lid of said receptacle for providing reciprocating flow of said hot water through said water permeable bottom surface and forced circulation of said hot water throughout the beverage material for brewing.

3,935,319

PROTEIN FOOD PRODUCT

Norman Bratton Howard, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 28, 1974, Ser. No. 473,544
Int. Cl.² A23J 3/00
U.S. Cl. 426—104 16 Claims

8. A shaped protein food product comprising a mixture of
edible protein fibers,
edible binder material, and
a stabilized fat consisting of from 85 to 95% edible triglyceride and from 5 to 15% ethylcellulose, by weight of stabilized fat,
said mixture being bound together to form a shaped fibrous protein food product.

3,935,320

TUBULAR CELLULOSIC CASING WITH CATIONIC THERMOSETTING RESIN COATING

Herman S. Chiu, Chicago, and Jerome J. M. Rasmussen, South Stickney Township, Cook County, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 4, 1973, Ser. No. 347,685
Int. Cl.² A23B 4/00
U.S. Cl. 426—105 14 Claims

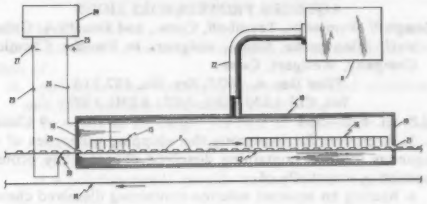
1. A tubular cellulosic fibrous food casing characterized as being opaque and having at least about 0.45% by weight of a coating of cured cationic thermosetting resin bonded to the interior and exterior surfaces thereof to afford resistance to degradation by cellulolytic enzymes.

3,935,321

ACCELERATED COOLING METHOD

Stephen Allen Sakler, Bronx, N.Y.; Samuel Joseph Porcello, Wayne, and Jack L. Rossen, Englewood, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Filed Jan. 11, 1974, Ser. No. 432,743
Int. Cl.² A23D 6/00
U.S. Cl. 426—244 6 Claims



1. The method of cooling an edible product having at least an outer layer of a hot fluid material which crystalizes upon cooling comprising the steps of exposing the product to a cooling atmosphere until the fluid material at the outer surface of the product has hardened, subjecting the product after the hardening of the surface thereof to a corona current to rapidly extract heat from the interior regions of the material without increasing the temperature of the hardened surface, the corona current flowing between oppositely polarized high voltage electrodes positioned on opposite sides of the product.

3,935,322

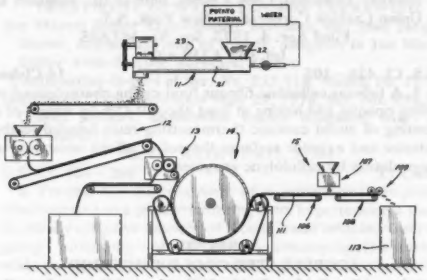
CHIP SEPARATING FROM A FRIED RIBBON

Verne E. Weiss, Wayzata; Glenn M. Campbell, and Gerald L. Wilson, both of Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Apr. 27, 1973, Ser. No. 355,260
Int. Cl.² A23L 1/01
U.S. Cl. 426—439 10 Claims

1. A method for preparing fabricated potato chips comprising mixing at least one member of the group consisting of potato flakes and potato granules with water to form a dough, said water being present in an amount of from 25 to 45 percent based on the total weight of the dough, sheeting said dough, cutting said sheeted dough to produce a continuing

ribbon, transporting said ribbon through a hot oil bath thereby frying said ribbon, said ribbon extending from the entrance to



the exit of said bath and then separating said ribbon into individual potato chips.

3,935,323

PROCESS FOR IMPROVING WHIPPING PROPERTIES OF AQUEOUS PROTEIN SOLUTIONS

Joseph V. Feminella, Trumbull, Conn., and Donald A. Grindstaff, Minnetonka, Minn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 6, 1973, Ser. No. 422,213

Int. Cl.² A23J *1/20*, *3/02*; A23G *3/00*

U.S. Cl. 426—564 **9 Claims**

1. A process for improving the whipping properties of an aqueous solution containing dissolved cheese whey protein consisting essentially of

a. heating an aqueous solution containing dissolved cheese whey protein having a protein concentration of about 5 grams per liter to about 100 grams per liter to a temperature within the range of at least 95°C. to less than 99° C. said aqueous solution being heated to a temperature within said range for not more than 5 minutes;

b. cooling said aqueous solution containing dissolved cheese whey protein to below about 60° C.; and

c. whipping said aqueous solution containing dissolved cheese whey protein within about 8 hours after heating.

3,935,324

CREAM BASE FOR CONFECTIONARY USE

Ulf Persmark, Karlshamn, and Jan-Erik Stenback, Morrum, both of Sweden, assignors to AB Karlshamns Oljefabriker, Karlshamn, Sweden

Filed Aug. 29, 1974, Ser. No. 501,672

Claims priority, application Sweden, Sept. 4, 1973, 73120032

Int. Cl.² A23G *3/00*

U.S. Cl. 426—572 **15 Claims**

1. A ready-to-whip cream base for confectionary use requiring no auxiliary emulsifiers or foaming agents, said cream base comprising from about 45% to 60% by weight of a fat phase, and a water phase; said fat phase comprising a fat base and lecithin, said fat base being composed of, by weight, from about 15% to about 25% coconut oil, from about 30% to about 50% hydrogenated oil of the stable β'-crystallizing type, and from about 35% to about 45% liquid vegetable oil, and said lecithin being present in a proportion of from about 0.5% to about 1.5% based on the weight of said fat base; and said cream base further comprising as part of said water phase from about 10% to about 35% water, from 15% to about 30% sugar and from about 0.03% to about 0.05% preservatives, based on the weight of said cream base.

3,935,325

FREEZE-THAW STABLE LIQUID COFFEE WHITENER

Cecilia Gilmore, and Donald E. Miller, both of Strongsville, Ohio, assignors to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 284,127, Aug. 28, 1972, abandoned. This application June 14, 1974, Ser. No. 479,684

Int. Cl.² A23D *5/00*

U.S. Cl. 426—613 **2 Claims**

1. A pareve fluid coffee whitener characterized by enhanced freeze-thaw stability and improved whiteness, comprising 5–18% by weight of vegetable fat, 1–3% by weight of vegetable protein, 5–15% by weight of sweetener, emulsifiers, and water to make up 100%, said emulsifiers consisting essentially of:

a. 0.3 to 0.6% by weight of said whitener of monoglycerides;

b. 0.1 to 0.3% by weight of an ethoxylated partial fatty acid ester of a hexitol selected from mannitol and sorbitol;

c. 0.05 to 0.2% by weight of a partial fatty acid ester of a hexitol selected from mannitol and sorbitol; and

d. 0.05 to 0.6% by weight of stearoyl-2-lactylic acid.

3,935,326

PROCESS FOR COATING TABLETS WITH AQUEOUS RESIN DISPERSIONS

Gregor Groppenbücher, Mannheim-Feudenheim; Peter Rieckmann, Mannheim-Waldhof, and Werner Rothe, Hockenheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Continuation-in-part of Ser. No. 44,557, June 8, 1970, abandoned, which is a division of Ser. No. 740,058, June 26, 1968, abandoned. This application Apr. 22, 1974, Ser. No. 463,216

Claims priority, application Germany, June 28, 1967, 1617351

Int. Cl.² A61K *9/32*, *9/369/42*

U.S. Cl. 427—3 **8 Claims**

1. Process for preparing coated tablets which comprises applying to a core of active material at least one layer of a coating composition comprising a film forming aqueous synthetic resin dispersion with a resin content between 30 and 60% by weight, from 2 to 50% by weight of a material which is soluble in either the gastric or alkaline juices of the small intestine and up to 50% by weight of one or more insoluble fillers the amounts of said soluble material and said fillers being based on the amount of said aqueous synthetic resin dispersion, the combined amount of said water soluble material and said fillers being at least 5–6%, and permitting said coating composition layer to dry.

3,935,327

COPYING USING PYROELECTRIC FILM

Allen L. Taylor, Woodbury Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 6, 1973, Ser. No. 385,848

Int. Cl. G03g *5/00*, *13/08*, *13/10*

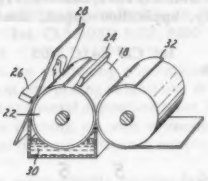
U.S. Cl. 427—19 **3 Claims**

1. A method for forming a copy of a graphic representation using a uniformly poled pyroelectric polymeric film comprising the steps of:

a. exposing said uniformly poled pyroelectric polymeric film to a heat source in accordance with the graphic represen-

tation to heat said film, thereby forming a charge pattern on said film in accordance with the graphic representation;

b. contacting said film bearing said charge pattern with toner particles charged so as to be deposited in accordance with the charge pattern on said film;



c. placing a sheet of a suitable substrate in registry on said film bearing said toner particle developed image to transfer said toner from said material to said substrate; and

d. fusing said toner to said substrate, thereby forming a completed copy of the graphic representation.

3,935,328

METHOD FOR PROVIDING DIELECTRIC ISOLATION IN AN EPITAXIAL LAYER OF A COMPOUND SEMICONDUCTOR USING THE PLASMA OXIDATION

Takuo Sugano, Tokyo, and Yoshifumi Mori, Ichikawa, both of Japan, assignors to Kentaro Hayashi, Tokyo, Japan

Filed Oct. 11, 1973, Ser. No. 405,733

Claims priority, application Japan, Oct. 12, 1972, 47-102281

Int. Cl.² B05D *5/12*

U.S. Cl. 427—34 **2 Claims**

1. A method for providing dielectric isolation of an epitaxial layer of a compound semiconductor of gallium arsenide (GaAs) comprising the steps of;

a. forming a film of said compound semiconductor on an insulative or semi-insulative substrate,

b. coating an aluminum (Al) mask layer by evaporation on the surface of the compound semiconductor film,

c. selectively removing the aluminum (Al) mask layer by a photoresist process from an area where the compound semiconductor is to be oxidized,

d. oxidizing the exposed area of removed aluminum (Al) of the compound semiconductor by placing it in a hot plasma produced by a high frequency hot plasma discharge at a temperature range of about 1,000°–1,300°C in an oxygen atmosphere of about 0.3 Torr until the oxidation is completed up to a depth to reach to the substrate, and

e. removing the remaining aluminum (Al) mask by etching.

3,935,329

METHOD OF MANUFACTURING NEW PAINTABLE RUBBER PRODUCTS

Albert F. Reilly, Howell, Mich.; Ivan C. Doddridge, Virginia Beach, Va., and Ming Chih Chen, St. Clair Shores, Mich., assignors to Sheller-Globe Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 358,514, May 9, 1973, Pat. No. 3,873,348. This application Jan. 27, 1975, Ser. No. 544,219

Int. Cl.² B05D *3/06;3/12*

U.S. Cl. 427—35 **29 Claims**

1. A method of manufacturing a flexible paintable rubber product, comprising the steps of:

formulating a composition comprising, percentages being by weight,

a. about 15 to about 90% of a cross-linkable rubber material selected from at least one of the group consisting of

styrene butadiene rubber, polybutadiene rubber, and isoprene rubber,

said rubber material also including less than 50% of ethylene-propylene diene monomer rubber or neoprene rubber,

b. about 0.01 to about 40% of a polymeric stiffening agent for providing a high flex modulus for the cured composition,

c. about 0.01 to about 50% of a plasticizing agent,

d. zero to about 5% of an accelerating agent,

e. 0.01 to about 10% of a curing agent,

f. zero to about 10% of an activating agent,

g. zero to about 80% of a filler material,

forming the product by molding said composition and curing the product at a temperature between about 275° and about 450° F for a residence time period between about 20 minutes and about ½ minute, preparing a clean surface on the molded product, applying a flexible color stable colored paint coating to the product.

3,935,330

TWO-STEP COATING PROCESS

Oliver W. Smith, South Charleston; Charles H. Carder, Charleston, and David J. Trecker, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 8, 1971, Ser. No. 205,855

Int. Cl. B44d *1/50;* **C09d** *3/58*

U.S. Cl. 427—41 **9 Claims**

1. A method for coating a substrate which comprises the steps of

A. applying a fluid coating composition to said substrate, said fluid coating composition comprising

a. from 0.1 to 50 weight per cent of a thermally curable reactive thermoset crosslinker selected from the group consisting of:

i. a polyfunctional epoxide having at least two oxirane units,

ii. the polyoxirane-containing low molecular weight polymers of (i),

iii. a urea/formaldehyde resin, or

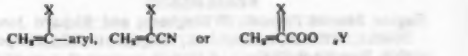
iiii. a melamine/formaldehyde resin,

b. from 0.1 to 50 weight per cent of a radiation and thermally curable reactive solvent selected from the group consisting of:

i. an acrylate or methacrylate of a monofunctional or polyfunctional alcohol, or

ii. an acrylamide or methacrylamide of a monofunctional or polyfunctional amine, said solvent having both at least one vinyl polymerizable double bond and at least one thermally sensitive hydroxyl, carboxyl, amino or oxirane group, and

c. the balance thereof being a radiation sensitive reactive component of the formula



wherein X is hydrogen or methyl; aryl is phenyl or substituted phenyl; z has a value of 1 to 4; when z is 1, Y is monovalent cycloalkyl of 5 to 12 carbon atoms, cycloalkenyl of 5 to 12 carbon atoms, $-C_mH_{2m}H$, $-C_mH_{2m}CN$, $-C_mH_{2m}Cl$, $-C_mH_{2m}NR_2''$, $-C_mH_{2m}COONR_2''$, $-C_mH_{2m}COOCH_2OCH_2CH_3$, or $-(C_pH_{2p}O)_rC_pH_{2p}H$, when z is greater than 1, Y is $-C_qH_{2q}-$, $-(C_pH_{2p}O)_xC_pH_{2p}-$, $-(C_pH_{2p}COO)_xC_pH_{2p}-$, $-C_qH_{2q-1}-$, or $-C_qH_{2q-3}-$; R'' is hydrogen or alkyl of 1 to 5 carbon atoms; m has a value of 1 to 10; r has a value of 0 to 4; p has a value of 2 to 4; q has a value of 2 to 8; x has a value of 1 to 5; and y has a value of 2 to 5;

B. subjecting said applied coating composition to ionizing or non-ionizing irradiation to initiate free-radical polymerization of components (b) and (c) and thereafter

C. subjecting the coated article of step (B) to elevated temperature of from 50° to 250°C. to thermally cure components (a) and (b) and obtain a solid, dry coating on said substrate.

9. A method as claimed in claim 1 wherein step (B) is carried out under an inert atmosphere.

3,935,331

PREPARATION OF OLEFIN SO_2 COPOLYMER ELECTRON BEAM RESIST FILMS AND USE OF SAME FOR RECORDING

Eugene Samuel Poliniak, Willingboro; Howard George Scheible, Livingston, and Richard Joseph Himics, Skillman, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,851
Int. Cl.² B05D 3/06; G11B 9/00
U.S. Cl. 427—43 6 Claims

1. A method of preparing an electron beam recording medium comprising a film of a copolymer of SO_2 and an olefin on a substrate which comprises

a. dissolving said copolymer in a solvent,
b. filtering the resultant solution through a filter having apertures on the order of 0.2 micron or smaller,
c. applying a copolymer film from said solution onto said substrate,
d. drying said film in a vacuum of at least 10^{-6} torr until said solvent is removed, and
e. maintaining said dried film moisture-free until it is exposed to an electron beam.

5. A method of recording information in the form of a relief pattern which comprises

a. dissolving a copolymer of SO_2 and an olefin in a solvent,
b. filtering the resultant solution through a filter having apertures on the order of 0.2 micron or smaller,
c. applying a copolymer film from said solution onto a substrate,
d. drying said film in a vacuum of at least 10^{-6} torr until said solvent is removed,
e. maintaining said dried film moisture-free until it is exposed to an electron beam,
f. exposing said film to a modulated beam of electrons, and
g. developing said film by dissolving the exposed portions in a solvent to form said relief pattern.

3,935,332

DEVELOPMENT OF POLY(1-METHYL-1-CYCLOPENTENE-SO_2) ELECTRON BEAM RESIST

Eugene Samuel Poliniak, Willingboro, and Richard Joseph Himics, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,801
Int. Cl.² B05D 3/06; G11B 9/00
U.S. Cl. 427—43 6 Claims

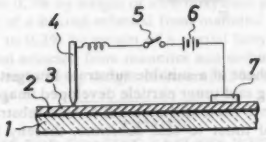
1. In a method of recording information whereby a modulated beam of electrons is scanned across the surface of a film of resist material which becomes more soluble in a developer solvent where impinged upon by the beam of electrons and the resist material is developed with the developer solvent so as to remove the solubilized portions thereof, the improvement which comprises employing as the resist material a film of a copolymer of SO_2 and 1-methyl-1-cyclopentene and developing with a solvent selected from the group consisting of 2-methylcyclohexanone, 3-methylcyclohexanone, and acetonyl acetate in acetone.

3,935,333

METHOD FOR FORMING A TRANSPARENT IMAGE ON A SHEET

Harunobu Muneoka, and Tuguo Nezu, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Tokyo, Japan

Filed Dec. 15, 1972, Ser. No. 315,472
Claims priority, application Japan, Dec. 18, 1971, 46-103046
Int. Cl.² B41C 3/08
U.S. Cl. 427—49 10 Claims



1. A method for forming a transparent image on a sheet which comprises the steps of: providing a sheet having a transparent film base, an opaque conductor layer formed on one side of said transparent film base, and a semi-conductive layer formed on said opaque conductor layer having a volume resistivity of 10^3 to 10^6 ohm·cm; applying from 10 to 70 volts between said opaque conductor layer and a stylus electrode contacting the surface of said semi-conductive layer and simultaneously rendering transparent or translucent those portions of the semi-conductive and conductor layers underlying said stylus forming an image; contacting the thus formed image sheet with a liquid for removing said semi-conductive layer at least in the image portion, said semi-conductive layer being formed from one of (1) a uniform dispersion of semi-conductive metal oxide particles in a binder, (2) a uniform dispersion of non-conductive particles and conductive substances in a binder, and (3) a homogeneous conductive polymer.

8. A method for forming transparent image on a sheet comprising a transparent film base, an opaque conductor layer being formed on one side of said transparent film base, and a semiconductive layer being formed on said opaque conductor layer comprising a uniform dispersion of metal compound particles in a non-conductive and polymeric organic binder, said particles being reduced to free metal by application of electric voltage, comprising the steps of:

A. applying electric voltage from 20 to 70 volts between said opaque conductor layer and a needle electrode contacting the surface of said semiconductive layer having a thickness of 2 to 50 microns and a volume resistivity of 10^3 to 10^6 ohm·cm where the image is formed;
B. contacting the formed image sheet with a corrosive liquid comprising an aqueous solution of a substance selected from the group consisting of hydrochloric acid, nitric acid, phosphoric acid, sulfuric acid, formic acid, acetic acid, propionic acid, butyric acid, oxalic acid, hydroxysuccinic acid, citric acid, phenolsulfonic acid, ferric chloride, potassium ferrocyanide, ammonium thiocyanate and phosphates of ammonium to selectively remove the semiconductive layer and the opaque conductor layer in the image portion; and
C. further contacting the image sheet with water or an organic solvent selected from the group consisting essentially of methyl isobutyl ketone, methyl ethyl ketone, toluene, xylene, tetrahydrofuran, butyl acetate, N,N-dimenthyl formamide, dimethyl sulfoxide, trichloroethylene, perchloroethylene, ethyl alcohol to remove the remaining semiconductive layer.

3,935,334
PROCESS FOR PREPARING A METALLIZED RESIN FILM FOR CONDENSER ELEMENT

Hiroshi Narui, Uji, and Terumi Shinohara, Joyo, both of Japan, assignors to Oike & Company, Ltd., Kyoto, Japan

Filed June 21, 1974, Ser. No. 481,916
Claims priority, application Japan, June 6, 1973, 48-72675; Dec. 3, 1973, 48-13828; June 1, 1974, 49-62397
Int. Cl.² B05D 5/12, 5/00
U.S. Cl. 427—81 18 Claims

1. In a process for producing a metallized resin film for a condenser element comprising at least one di-electric resinous layer and at least one metal deposition layer, the improvement which comprises forming on said resinous layer a margin wherein the metal deposition layer is not present by the steps comprising

1. providing a water-soluble coating layer by applying a water-soluble paint to at least one side of the dielectric resinous layer in the portion of the resinous layer corresponding to the pattern of margin,
2. providing a metal deposition layer on the dielectric resinous layer partially coated with the water-soluble coating layer, said metal deposition layer being applied by means of vacuum metallizing procedures, and
3. removing the water-soluble coating layer and the metal deposition layer thereon by dissolving away the water-soluble coating layer with water.

4. The process of claim 2, wherein the dielectric resin film is a member selected from the group consisting of the films made of polyethylene terephthalate, polyethylene naphthalate, polypropylene, polycarbonate, polystyrene, polytetrafluoroethylene, polyamide, polyvinyl chloride and cellulose acetate.

7. The process of claim 5, wherein the dielectric resinous coating is made of at least one member selected from the group consisting of ethyl cellulose, cellulose acetate, cellulose acetate butyrate, polycarbonate, polystyrene, saturated polyester resin, acrylic resin, melamine resin, urea resin, phenolic resin, unsaturated polyester resin, thermosetting-type acrylic resin, alkyd resin, epoxy resin and urethane resin.

3,935,335
METHOD FOR PRODUCING SUPPORT FOR ELECTROPHOTOGRAPHIC MATERIAL AND ELECTROSTATIC RECORDING MATERIAL

Isamu Maruyama; Shigeyoshi Suzuki, both of Nagaokakyo, and Yoshitake Yoshihiro, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Filed Apr. 10, 1974, Ser. No. 459,789
Claims priority, application Japan, Apr. 26, 1973, 48-46688
Int. Cl.² B05D 5/12
U.S. Cl. 427—121 14 Claims

1. In a method for producing a support for electrophotographic materials or electrostatic recording material which comprises applying an electroconducting agent to an untreated paper, the improvement comprising the first step of fixing an anionic sizing agent which is at least one member selected from the group consisting of

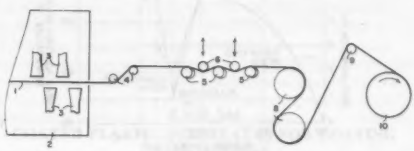
a. sodium salts of maleic and derivative copolymers,
b. ammonium salts of copolymers containing carboxyl groups,
c. alkyd resin,
d. petroleum resin,
e. acrylic resin, and
f. polyacrylamide resin

into a layer of the untreated paper and the second step of coating an electroconductive quaternary ammonium polymer on the thus treated paper.

3,935,336
PROCESS FOR MAKING CARRIER SHEETS IMPREGNATED WITH AMINOPLAST CONDENSATION RESINS

Rötger Mitgau, Essen-Kupferdreh; Bruno Petrik, Essen, and Dietmar Schedlitzki, Niederwenigern, all of Germany, assignors to Th. Goldschmidt AG, Germany

Filed Feb. 16, 1973, Ser. No. 333,311
Claims priority, application Germany, Mar. 9, 1972, 2211312
Int. Cl.² D06M 13/54
U.S. Cl. 427—173 9 Claims



1. A process for making a carrier sheet of paper treated with an aqueous solution of at least one heat-hardenable aminoplast condensation resin, comprising passing said treated sheet through a heated zone in which said heat-hardenable aminoplast resin is dried and precondensed,

stretching said treated sheet at a temperature in the range of about 80°C to about 130°C, and in a direction transverse to the grain direction of said sheet,

and cooling said treated, stretched sheet.

3,935,337
PREPARATION OF LIQUID CRYSTAL CONTAINING POLYMERIC STRUCTURE

Lynn J. Taylor, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 331,445, Feb. 12, 1973, abandoned, which is a continuation of Ser. No. 121,156, Feb. 4, 1971, abandoned. This application Nov. 7, 1973, Ser. No. 413,655
Int. Cl.² C09K 3/34, 11/06
U.S. Cl. 427—180 5 Claims

1. A process for preparing a thin, layer-like film structure of controlled thickness suitable for use in electronic display devices comprising providing a polymeric material film, applying a liquid-crystal material to the surface of said polymeric material film and then heating said polymeric film to a temperature sufficient to promote diffusion of said liquid-crystal material therein to form said film structure containing said polymeric material in matrix form with said liquid-crystal material as a dispersed phase embedded in said polymeric material film such that said liquid-crystal material is in intimate contact with said matrix, said polymeric material being chemically and physically inert relative to the contained liquid-crystal material.

3,935,338
PROCESS FOR THE PREPARATION OF PRESSURE-SENSITIVE ADHESIVE ARTICLES

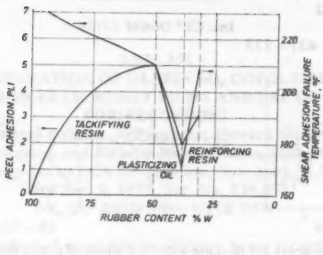
William J. Robertson, Ronald K. Crossland, James T. Harlan Jr. and, all of San Marino, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1973, Ser. No. 353,865
Int. Cl.² C09J 7/04
U.S. Cl. 427—207 5 Claims

1. An improved process for making a pressure-sensitive adhesive article comprising the steps of

a. mixing 100 parts by weight of a block copolymer of the groups consisting of block copolymers having at least two monoalkenyl arene polymer blocks A and at least one elastomeric conjugated diene polymer block B, said blocks A comprising 8–55 percent by weight of the copolymer and hydrogenated derivatives of the same, 50–200 parts by weight of a tackifying resin compatible

with block B, 20–75 parts by weight of a reinforcing resin compatible with blocks A and having a softening point at least 20°C higher than that of blocks A, and 25–100 parts by weight of a hydrocarbon extending oil;



b. heating the mixture to a fluid state;

c. and wiping a moving substrate with the fluidized mixture, said wiping action being in the absence of solvents for the mixture and without film formation of the mixture prior to contact with the substrate.

3,935,339

METHOD FOR COATING PARTICULATE MATERIAL THEREOF

Claude E. Cooke, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed July 16, 1973, Ser. No. 379,286

Int. Cl.² B05D *7/00*

U.S. Cl. 427—216 **17 Claims**

1. A method of forming free-flowing resin-coated particles which comprises:

a. coating the particles of a particular substrate material with a liquid thermosetting epoxy resin;

b. in the presence of a curing agent capable of curing said epoxy resin to a solid infusible state, agitating said coated particles in a nonpolar liquid immiscible with said liquid resin and containing a nonionic surfactant having a molecular weight of at least 2000 which retards agglomeration of said resin coated particles until said epoxy resin cures to a solid, infusible state; and thereafter

c. removing the coated particles from said immiscible liquid.

3,935,340

PROCESS FOR PREPARING PLASTIC COATED METAL POWDERS

Tadashi Yamaguchi; Takayuki Ono, both of Sendai; Hiroshi Hoshi, Narashino; Michio Hirakawa, and Isao Watanabe, both of Ichikawa, all of Japan, assignors to Lion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,321

Claims priority, application Japan, Dec. 4, 1972, 47-121357

Int. Cl.² B05D *7/00*

U.S. Cl. 427—216 **8 Claims**

1. A process for preparing plastic coated metal powder which comprises suspending a metal powder in an aqueous medium containing a radical-polymerizable monomer and initiating polymerization of said monomer with an initiator consisting essentially of acidic sulfite ions in the presence of said metal powder.

3,935,341

METHOD FOR RENDERING WOOD RESISTANT TO FIRE

Karl-Otto Sorensen, and Jorgen Sondergaard, both of Naesteved, Denmark, assignors to Kanamark International Limited, Cayman Islands, British W. Indies

Continuation of Ser. No. 296,365, Oct. 5, 1972 abandoned, which is a continuation of Ser. No. 99,382, Dec. 18, 1970, abandoned.

This application Dec. 7, 1973, Ser. No. 422,935

Claims priority, application Denmark, Dec. 23, 1969, 6836/69

Int. Cl.² B05D *3/02*

U.S. Cl. 427—317 **4 Claims**

1. A method for rendering wood resistant to fire which comprises:

heating the wood to dry the same to a mositure content of below about 4%;

impregnating the heated, dried wood, while still hot, with an aqueous solution containing from about 7 to about 70% by weight of a formaldehyde-reactive monomer, said solution having a temperature of at least 80°C.;

heating the formaldehyde-reactive monomer-impregnated wood to dry the same to a moisture content of below about 4%;

impregnating the dry, formaldehyde-reactive monomer-containing wood with a stoichiometric excess of formaldehyde; and

heating the now twice impregnated wood to effect a condensation reaction between the formaldehyde-reactive monomer and the formaldehyde, and to dry the wood to a moisture content of about 4%.

3,935,342

HYDROPHILIZATION OF NON-POLAR SURFACES

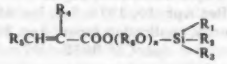
Drahoslav Lim, Palo Alto, Calif., assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Continuation-in-part of Ser. No. 331,093, Feb. 9, 1973. This application Dec. 4, 1973, Ser. No. 421,718

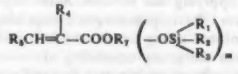
Int. Cl.² C08F *8/10;* **C08J** *5/24*

U.S. Cl. 427—341 **22 Claims**

1. A process for preparing a hydrophobic polymer substrate having a coating thereon of a hydrophilic polymer selected from the group consisting of homopolymers and copolymers comprising (A) coating said substrate with material selected from the group consisting of (1) a silylated monomer having the formula:

(a) 

or

(b) 

and (2) a mixture of said silylated monomer and a copolymerizable monomer; wherein R_6 is hydrogen or lower alkyl; R_4 is hydrogen, lower alkyl, halogen of atomic weight 9 to 80, phenyl or cyano, R_5 is alkylene or haloalkylene of 2 to 4 carbon atoms; R_7 is alkylene of 3 to 6 carbon atoms; n is an integer of 1 to 4; m is an integer of 2 to 5; and R_1, R_2 and R_3 are lower alkyl, pehnyl, or tolyl; (B) hydrolyzing the polymerized monomer or mixtures of monomers to form the hydrophilic polymer by replacing the

groups by hydrogen atoms.

3,935,343
MOLTEN SALT METHOD OF PRODUCING FIRE RESISTANT WOOD ARTICLES

Harold W. Nuttall, Long Grove, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 224,597, Feb. 7, 1972, abandoned. This application Feb. 21, 1974, Ser. No. 445,372
Int. Cl.² B44D 1/14; C09K 3/28
U.S. Cl. 427—353 **16 Claims**

1. A method for imparting fire resistance to wood articles within a period of 3 minutes which comprises immersing the wood article in molten ammonium phosphate substantially free of water under a pressure of at least about 10 p.s.i.g.

3,935,344
SIZING COMPOSITION AND GLASS FIBERS TREATED THEREWITH

William H. Haggerty, Reynoldsburg, and Gerhard N. Bolen, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 81,157, Oct. 15, 1970, abandoned. This application July 17, 1972, Ser. No. 272,523
Int. Cl.² D02G 3/00
U.S. Cl. 428—378 **6 Claims**

1. Glass fiber strands having from approximately 1 to 2 percent by weight of a dried coating of a sizing composition comprising in percent by weight:

Materials	% by Weight
Water soluble resin mixture given below	1.50
Vinyl acetate, N-methylol-acrylamide copolymer emulsion	3.85
Ethylene-vinyl acetate copolymer emulsified particles stabilized by a partially acetylated polyvinyl alcohol protective colloid	3.85
Gamma-methacryloxypropyl-trimethoxysilane	0.10
Glacial acetic acid	0.30
Wax	0.10
Lubricant	0.30
Paintable fluid silicone emulsion	0.50
Deionized water	Balance

said water soluble resin mixture being the reaction product of 1 mol of a diepoxy with 1 mol of diethanolamine and 1 mol of a polyglycol monoester with the preponderance of the diepoxy molecules having one diethanolamine molecule reacted with one oxirane group thereof and one polyglycol monoester molecule reacted with the other oxirane group thereof.

3,935,345
ELECTROLESS PLATING OF PEROXIDE FORMING METALS

Luis E. Lema, Milford, Mass., assignor to Unitrode Corporation, Watertown, Mass.

Filed Aug. 20, 1974, Ser. No. 499,077
Int. Cl.² C23C 3/02
U.S. Cl. 427—383 **45 Claims**

1. An oxidation-reduction process for electroless plating of a peroxide forming transition base metal selected from Group VI of the periodic table of elements comprising the steps of:
   a. oxidizing oxides on the surface of said peroxide forming metal with hydrogen peroxide to produce metal peroxides of said peroxide forming metal; and
   b. reducing in solution ions of a metal plating solution with said metal peroxides to deposit a protective metal plate on said peroxide forming metal;
   c. said ions including ions selected from the group consisting of nickel, chromium, cobalt, rhodium or combinations thereof.

3,935,346
COATED PLASTIC SUBSTRATES FOR COATING COMPOSITIONS

Edward J. Stengle, and James J. Tillman, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 340,071, March 12, 1973, Pat. No. 3,868,343. This application July 1, 1974, Ser. No. 484,556
Int. Cl.² B05D 7/02; C08J 7/04
U.S. Cl. 427—385 **17 Claims**

1. A method for providing a solid organic polymeric surface with a hard, strongly adhered, abrasionresistant, mar-resistant, chemically resistant, acetone-resistant, coating wherein a thermosettable resin system is cured in a short time, said method comprising the steps of:
   1. applying onto said polymeric substrate an organic solvent solution of a coating composition prepared by a method which comprises:
      a. heating methyltrialkoxysilane, wherein the alkoxy group contains between one and six carbon atoms, with between about 1.5 moles to about 10 moles of water per mole of total silane in the presence of an effective catalyzing amount of a acid hydrolysis catalyst between about 40°C. up to and including the reflux temperature for a period of about 1–10 hours so as to produce a substantially gel-free solution which contains a dissolved, hydrolyzed and partially condensed organopolysiloxane,
      b. concentrating the solution containing said dissolved, hydrolyzed and partially condensed organopolysiloxane by heating to remove some but not all volatile material, including alkanol by-product and some water, so as to obtain a solution of a hydrolyzed and further partially condensed organopolysiloxane,
      c. precuring the resultant product by heating below the gel point thereof to remove volatiles and produce a solvent-soluble, further-curable organopolysiloxane, and
      d. adding in an amount, of between about 3% to about 15% by weight based on organopolysiloxane solids, an alkylated melamine-formaldehyde partial condensate resin to said solvent-soluble, further-curable organopolysiloxane, said alkylated resin being a methylated and C_3–C_4 alkylated resin wherein the molar ratio of methylation to C_3–C_4 alkylation is at least 1:1 and wherein said resin, based on a 66–67 weight percent solution in a 1:1 weight mixture of isobutanol to isopropanol has a hydrocarbon tolerance of about 20–200 and a water tolerance of about at least 300, and
   2. evaporating said solvent, and heating said substrate at a temperature and for a time sufficient to thermoset the residual coating composition and form a hard, mar-resistant, abrasion-resistant, chemically resistant, acetone-resistant, strongly adhered coating consisting essentially of the heat cured product of an organopolysiloxane and a methylated and lower alkylated melamine-formaldehyde resin, on said substrate.

3,935,347

DISPERSION OF ARYLENE SULFIDE POLYMER CONTAINING FLUOROCARBON POLYMER FOR FORMING COATINGS

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 299,065, Oct. 19, 1972, Pat. No. 3,856,735. This application Sept. 13, 1974, Ser. No. 505,917

Int. Cl.² B05D 7/14, 1/02

U.S. Cl. 427—388 16 Claims

1. A process for forming a coated article comprising:

applying to a substrate a dispersion formed by subjecting fluorocarbon polymer, in particulate form having a molecular weight sufficient to give a melt viscosity flow of 0 at 380°C using a 5,000 g. weight, to intensive milling by ball milling or rod milling with a liquid selected from water, ethylene glycol, or propylene glycol; and thereafter adding thereto poly(arylene sulfide) in particulate form and a pigment or filler in particulate form and subjecting the resulting mixture to additional intensive milling by ball milling or rod milling; and

heating said thus applied dispersion at a temperature of at least 500°F to form a cured coating.

3,935,348

METHOD OF BONDING SILICONE RUBBER TO A PRIMED SURFACE

Christopher John Smith, Llanishen, Wales, assignor to Dow Corning Limited, Barry, Wales

Filed Feb. 14, 1974, Ser. No. 442,560

Claims priority, application United Kingdom, Feb. 20, 1973, 8162/73

Int. Cl.² C09J 5/02; B32B 25/20, 21/08, 13/12

U.S. Cl. 427—408 5 Claims

1. A method of producing a porous masonry or wood substrate having bonded thereto a silicone rubber which comprises (1) applying to the surface of a porous substrate which is of masonry or wood a coating of a primer composition comprising (a) a cyclised rubber resin, (b) from 0 to 40%, based on the weight of (a), of a film forming polyester resin which is compatible with (a), and (c) a volatile organic solvent, the solvent (c) comprising from 45 to 85% of the total weight of the primer composition, (2) drying the applied coating and (3) applying to the primed surface a room temperature vulcanisable silicone rubber composition selected from the group consisting of (I) compositions based on an organosiloxane polymer having in the molecule (A) silicon bonded oxime radicals, (B) a mixture of an organosiloxane polymer having silanol groups and a silane having at least 3 silicon-bonded oxime groups per molecule, or (C) a mixture of (A) and (B), (II) compositions based on (D) an organosiloxane polymer having terminal silicon-bonded acyloxy groups, (E) a mixture of a silanol-terminated organosiloxane polymer and a silane having at least 3 silicon-bonded acyloxy groups per molecule, or (F) a mixture of (D) and (E), and (III) compositions based on (G) an organosiloxane polymer having terminal silicon-bonded amido or amino groups, (H) a mixture of a silanol-terminated organosiloxane polymer and a silylamine or silylamide or (K) a mixture of (G) and (H).

3,935,349

PROCESS OF COATING AN ALUMINUM ARTICLE

Shiro Terai, Nagoya; Akinari Ichiryu, Aichi; Toshio Suzuki, Kasugai, and Toshinori Maeda, Nagoya, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Oct. 1, 1973, Ser. No. 402,364

Claims priority, application Japan, Oct. 6, 1972, 47-101027

Int. Cl.² B05D 7/14; C23F 7/06

U.S. Cl. 427—409 4 Claims

1. A process for coating an aluminum article, which comprises treating an aluminum article having an anodized oxide surface layer or a boehmite surface layer with a silane compound of the formula:

$$[R(CH_2)_n]-Si-X_3$$

wherein n is 1, 2 or 3, R is an alkylenediamino group of 1-4 carbon atoms, an alkoxy group having an epoxy group and containing 1–4 carbon atoms, X is at least one group which is reactive with aluminol and is selected from the group consisting of an alkoxy group of 1–4 carbon atoms and an alkyl group of 1–4 carbon atoms provided that all of the group X do not constitute the alkyl group simultaneously; then coating the so-treated aluminum article with a known coating composition containing a thermo-setting resin as the film forming material by applying said coating composition onto the oxide layer surface of the aluminum article by means of a coating technique other than electrodeposition, and finally heat-curing the resin coating on the aluminum article.

3,935,350

SUPPRESSION OF CREVICE CORROSION IN GASKETED TITANIUM CREVICES BY THE USE OF RUBBER COMPOUND GASKETS SUBSTANTIALLY FREE OF CALCIUM

Donald W. Du Bois, and William B. Darlington, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 348,452, April 5, 1973, Pat. No. 3,857,773. This application June 27, 1974, Ser. No. 483,725

Int. Cl.² C25B 1/24

U.S. Cl. 428—35 3 Claims

1. In a titanium vessel in an electrolytic system having a pair of surfaces, at least one of said surfaces being of titanium, said surfaces being separated by a gasket with a crevice therebetween subject to crevice corrosion, the improvement wherein said gasket comprises a substantially calcium free rubber composition resistant to chloride brines containing less than 0.07 weight percent calcium as determined by atomic adsorption spectroscopy and less than 10 weight percent calcium in the ash by emission spectroscopy.

3,935,351

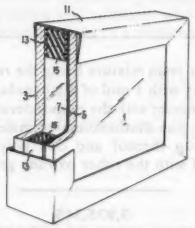
MULTIPLE GLAZED WINDOWS INCLUDING SELECTIVE REFLECTING METAL/METAL OXIDE COATINGS

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 252,803, May 12, 1972, Pat. No. 3,846,152. This application May 17, 1974, Ser. No. 470,769

Int. Cl.² B32B 17/06; E06B 3/24; G02B 5/28

U.S. Cl. 428—34 1 Claim



1. In a multiple glazed glass article comprising at least two glass panels disposed in substantially parallel relation, and spaced apart by a space member disposed between said panels about their margins and held in said relation by a marginal frame member, the improvement comprising at least two coatings affixed to at least one side of at least one of said panels:

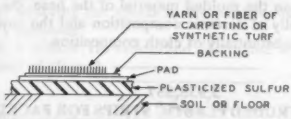
a. a first coating affixed to the glass said first coating being a transparent metal coating consisting essentially of nickel substantially in its reduced metallic state; and

b. a second coating affixed to the first coating said second coating being a transparent metal oxide coating consisting essentially of copper oxide of from about 50 to about 1500 angstroms.

3,935,352
SUPPORTED TURF OR CARPET-LIKE MATERIAL

William G. Toland, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 29, 1974, Ser. No. 474,456
Int. Cl.² D03D 27/00; D04H 11/00
U.S. Cl. 428—95 6 Claims



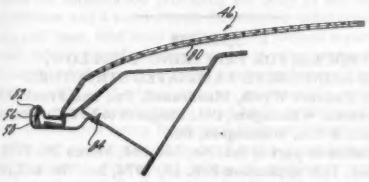
1. A method for obtaining a supported turf or carpet-like structure which comprises placing a layer of molten plasticized sulfur on a surface and then placing, on the layer of plasticized sulfur, synthetic turf or carpet-like material having its own backing, and wherein the synthetic turf or carpet-like material is placed backing side down on the layer of plasticized sulfur.

5. A supported turf or carpet-like structure comprising a solidified layer of plasticized sulfur and synthetic turf or carpet-like material placed thereon and wherein the synthetic turf or carpet-like material has its own backing.

3,935,353
HEAT SHRINKABLE DECORATIVE COVERING MATERIAL FOR VEHICLE PANELS

Ralph G. Doerfling, Walled Lake, and Charles J. Motycka, Detroit, both of Mich., assignors to Detroit Gasket & Manufacturing Co., Oak Park, Mich.

Division of Ser. No. 255,797, May 22, 1970, Pat. No. 3,846,200. This application July 8, 1974, Ser. No. 486,517
Int. Cl.² B32B 3/06; B62D 27/00; B60J 7/00
U.S. Cl. 428—99 3 Claims

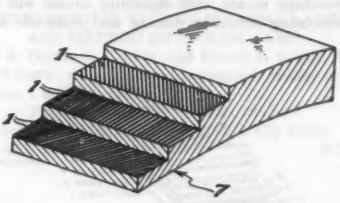


1. A decorative plastic covering material for vehicle roof panel and the like comprising a plastic sheet composed of a heat-softenable thermoplastic material having a heat-softening point of about 200°F up to about 300°F and incorporating a heat-activatable adhesive film over substantially the entire underside surface thereof, said adhesive film having a heat-activatable temperature at which tackification thereof occurs above the initial heat-softening point of said plastic sheet, said sheet being of a preselected shape and size and incorporating a convex contour over the inner area thereof of a magnitude in excess of the convex contour of a rigid vehicle roof panel over which the sheet is adapted to be applied, said plastic material in said inner area being in a prestretched condition and characterized as incorporating a memory therein for effecting a shrinkage of said sheet in response to a heating thereof to a temperature at which said sheet becomes plastically deformable, and fastening means comprising longitudinally extending clips of arcuate cross section secured along at least a portion of the terminal edge portions of said sheet for overlying and interlockingly engaging the peripheral edge of a vehicle roof panel for locating said sheet in proper registration thereover and for securing the terminal edges of said sheet against movement relative to a vehicle roof panel in response to a heating and shrinkage of said sheet when disposed in overlying relationship on the vehicle panel.

3,935,354
SHAPED ARTICLES OF PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES

Eugene L. Olcott, 6504 Lakeview Drive, Falls Church, Va. 22041

Division of Ser. No. 65,899, Aug. 21, 1970, Pat. No. 3,738,906. This application Nov. 27, 1972, Ser. No. 309,641
Int. Cl. B32b 5/12
U.S. Cl. 428—107 5 Claims



1. A shaped pyrolytic graphite article comprising a matrix containing embedded therein at least one reinforcing refractory filament or strand layer, said filament or strand layer comprising a plurality of unidirectional and substantially parallel, laterally spaced, individual, continuous refractory filaments or strands, said matrix comprising crystallite layers of pyrolytic graphite containing embedded SiC aciculae in which the longitudinal axes of said aciculae are aligned substantially in the c-direction relative to the a-b plane of the associated pyrolytic graphite crystallite, said SiC aciculae comprising about 5% to about 95% by volume of said matrix, said crystallite layers being nucleated from each of said individual filaments or strands and interconnected to form a continuous matrix phase surrounding and interconnecting each of said filaments or strands.

2. The article of claim 1 wherein said article comprises a plurality of reinforcing layers.

3. The article of claim 2 wherein the unidirectional, substantially parallel filaments or strands comprising one reinforcing layer are oriented in a direction different from the unidirectional, substantially parallel filaments or strands comprising another reinforcing layer.

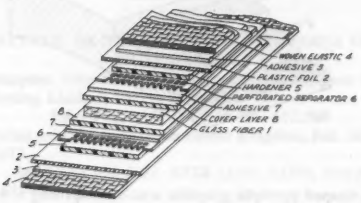
3,935,355
WRAPPING MATERIAL

Hans Georg Kuhn, Heerstrasse 131/135, D-1000 Berlin 19, Germany

Filed Dec. 20, 1972, Ser. No. 317,056
Claims priority, application Austria, Dec. 28, 1971, 11166/71
Int. Cl.² B32B 3/10
U.S. Cl. 24—150 R 32 Claims

1. In an elongated wrapper which is initially flexible and which when wrapped around one or more bodies is adapted to be stretched and to assume a substantially rigid condition, outer, elongated, tubular, impermeable, elastic envelope means having in a transverse direction a width which is a relatively small fraction of its length in a longitudinal direction and having a generally flat cross sectional configuration for surrounding one or more bodies while being stretched in said

longitudinal direction and wrapped around the bodies, said envelope means having an inner surface carrying one of a pair of materials which when they combine react to assume a hardened condition, said one material being distributed in said longitudinal direction along said inner surface of said envelope means and the other of said materials being situated in the interior of said envelope means between opposed wall portions thereof which extend in said longitudinal direction, and separating means situated in the interior of said envelope means between said materials and separating the latter from each other for preventing them from combining with each other, said separating means including an apertured layer of sheet material and a covering sheet material which is relatively brittle and which has the property of rupturing in response to stretching of said envelope means in said longitudinal direction when said envelope means is wrapped around one or more of said bodies, said covering sheet material being adhered to and covering said apertured sheet material to close the apertures thereof so that upon rupturing of said covering sheet material in response to said longitudinal stretching of said envelope means, said separating means will assume a non-separating condition placing said materials in contact



with each other through apertures of said apertured sheet material so that they will combine to assume said hardened condition in response to stretching of said envelope means in said longitudinal direction and wrapping of said envelope means around one or more bodies, said envelope means and separating means both being transparent while said pair of materials include a material which initially is non-transparent but which becomes transparent when said pair of materials combine with each other, so that the transparency resulting from the combining of said pair of materials gives a visual indication of the hardening reaction and renders visible that part of a body which is covered by the wrapper.

32. The combination of claim 1 and wherein said pair of materials are respectively, a polymerizable material and a hardener therefor, releasable fastener means coacting with windings of the wrapped envelope means and the structure therein for fastening them to each other, said releasable fastener means including a push member having a pointed shank to pierce through the wrapping and a receiving member having a recess for receiving the pointed shank, and said shank being made of polystyrene while said polymerizable material is a polyester with which said polystyrene becomes bonded so that the polymerizable material will be united with said shank.

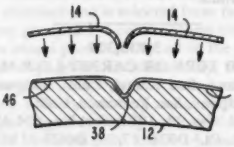
3,935,356

FANCIFUL OBJECT

Irene M. Minow, Box 325, Cripple Creek, Colo. 80813

Filed May 29, 1973, Ser. No. 364,713
Int. Cl.[2] B32B *3/30*
U.S. Cl. 428—163 **4 Claims**

1. A fanciful object comprising a base of relatively hard, molded material having a selected shape and a plurality of grooves in the surface thereof and panels of flexible covering material secured to and conforming to selected portions of the surface of the base, the margins of said panels being at least partially within and along said grooves, and the panels being substantially coextensive with areas defined within said grooves and combining with exposed surface areas of the base to give the object an appearance of being substantially completely comprised of the flexible covering material of the



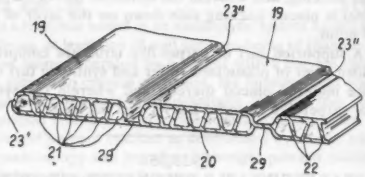
panels rather than the molded material of the base, the base being substantially of ceramic composition and the covering material being substantially of cloth composition.

3,935,357

HOLLOW EXTRUDED PLASTIC STRIPS FOR PACKINGS

Pietro Padovani, Verona, Italy, assignor to I. S. A. P. S.p.A., Verona, Italy

Filed Mar. 27, 1973, Ser. No. 345,415
Int. Cl.[2] B32B *3/02, 3/26;* **B29D** *23/04;* **B65D** *81/02*
U.S. Cl. 428—166 **2 Claims**



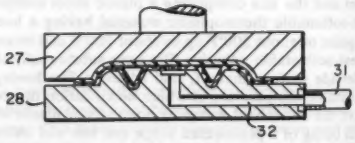
1. A hollow extruded strip having at least one end, made of plastic material comprising an outer wall forming a closed triangular shape when viewed in cross-section taken transverse to the longitudinal axis of the strip, and a plurality of inner walls parallel to the longitudinal axis of the strip, formed integral with and connecting opposed portions of said outer wall, wherein the homogeneous molecular orientation of said plastic material in the longitudinal direction of said strip.

3,935,358

PROCESS FOR PREPARING A HOLLOW, RIB-REINFORCED LAMINATED STRUCTURE

Nathaniel Convers Wyeth, Mendenhall, Pa., and Frank William Arnoth, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 346,164, March 29, 1973, abandoned. This application Feb. 15, 1974, Ser. No. 443,199
Int. Cl.[2] B29C *17/04;* **B32B** *3/00, 31/20*
U.S. Cl. 428—166 **34 Claims**



1. A process for preparing a hollow, ribreinforced, laminated article consisting essentially of:

a. placing two sheets between opposing mold platens, the sheets being aligned such that the sheet surfaces are in interfacial contact, at least one of the sheets being a

thermoplastic material heated to its thermoforming temperature and at least one of the sheets being provided with grooves or integral projections, on the surface which contacts the other sheet, which form fluid passageways, and at least one of the mold platens being provided with a mold cavity to form a shaped article having ribs;

b. closing the mold platens to contact the sheets and position the mold cavity contiguous to the thermoplastic sheet which is at its thermoforming temperature;

c. introducing a fluid into the fluid passageways to distend the thermoplastic sheet into its mold cavity forming a shaped article having ribs, while the closed mold platens maintain contact between the sheets in the nondistended areas; and

(d) adhering the sheets in the nondistended areas to form a laminate.

34. A hollow, rib-reinforced, laminated article made by the process of claim 1.

3,935,359
RETROREFLECTIVE SHEETING AND METHOD AND APPARATUS FOR PRODUCING SAME

William P. Rowland, Southington, Conn., assignor to Rowland Development Corporation, Kensington, Conn.

Division of Ser. No. 265,736, June 23, 1972, Pat. No. 3,811,983. This application Filed Feb. 13, 1974, Ser. No. 441,950. The portion of the term of this patent subsequent to Aug. 15, 1989, has been disclaimed.

Int. Cl.² B29D 7/08; G02B 5/12

U.S. Cl. 428—172 9 Claims

1. Retroreflective sheeting comprising a body portion having smooth, substantially parallel opposite surfaces, and a multiplicity of minute cube corner formations closely spaced thereon and projecting from one of said surfaces thereof, each of said cube corner formations having three faces and a base adjacent said body portion with a side edge dimension of not more than about 0.025 inch and being a composite of a first resin for formulation providing the body of the cube corner formation and a second resin formulation substantially providing said base, said body portion being formed separately from said cube corner formations and said cube corner formations being bonded to said body portion by said second resin formulation with said close spacing substantially avoiding any smooth areas therebetween, said body portion and cube corner formations being fabricated from transparent synthetic resin and said first and second resin formulations of said cube corner formation being of different composition and of substantially the same refractive index to provide retroreflective sheeting in which those light rays entering through the other of said surfaces of said body portion predominately pass through said body portion and into said cube corner formations and are reflected thereby back through said body portion along paths that are substantially parallel to their paths of entry.

3,935,360
COMPOSITE PAD

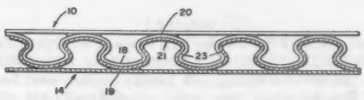
Erik Brown, Amherst, N.H., assignor to Brown Products, Inc., Amherst, N.H.

Continuation-in-part of Ser. No. 292,774, Sept. 27, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 436,837

Int. Cl.² B32B 3/00, 3/28

U.S. Cl. 428—186 1 Claim

1. A corrugated board structure defined by a perimeter comprising two corrugated boards each having a planar lining sheet adhered to a corrugated member wherein the corrugated members of each board are in nesting relationships, the corrugations being exposed to view at locations along said perimeter and closely adjacent said perimeter the corrugations being inelastically deformed into an interlocking reentrant configuration, and not being deformed from their initial corrugated shape elsewhere whereby the structure retains its ability to resist crushing.



3,935,361
MAGNETIC IMPULSE RECORD ELEMENT LAMINATE AND METHOD OF MAKING SAME

Michael B. Dorfman, Clinton, and Robert E. Logan, Easton, both of Conn., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed May 3, 1973, Ser. No. 356,917

Int. Cl.² G11B 5/70, 5/80, 5/84; B32B 31/12

U.S. Cl. 428—189 9 Claims

1. As an article of manufacture, a vinyl plastic member having a surface at least a portion of which is provided with a coating consisting of a dry residue of a partially hydrolyzed vinyl chloride-vinyl acetate copolymer comprising, on a solids basis, from about 88 to about 94 weight percent polyvinyl chloride, from about 2 to about 6 weight percent polyvinyl acetate, and from about 2 to about 10 weight percent polyvinyl alcohol activatable to an adhesive condition when heated and a transferrable magnetic impulse record element greater than 0.3 inches in width carried on a separable backing strip comprising a dispersion of magnetic particles in a binder matrix overlying and bonded to said coating by a hot stamping process, said coating having a thickness in the range of 0.01 to 0.03 mils and forming an interface between the record element and the vinyl plastic member whereby the amount of cupping which accompanies the transfer of the impulse record is less than 200 microinches per 0.1 inch of the record element width.

3,935,362
IMAGE CONTROL MEANS AND STRUCTURED TRANSFER SHEET FOR THERMAL REPRODUCTION PROCESSES

Joseph Tat-Hin Sund, Los Angeles, and Yoshikazu Yamada, Irvine, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

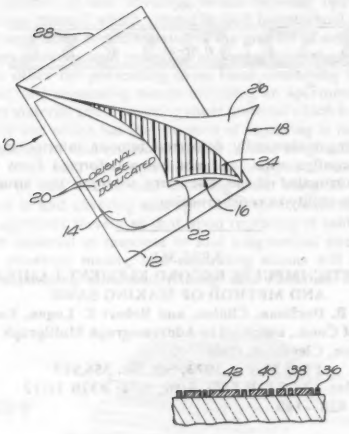
Filed Oct. 25, 1973, Ser. No. 409,531

Int. Cl.² B41M 5/10, 5/18

U.S. Cl. 428—207 7 Claims

5. A transfer sheet for use in a thermal transfer process for reproducing a thermally detectable original image, comprising a substrate and a discontinuous layer thereon in the form of a pattern of a plurality of closely spaced discrete carbon regions of thermally transferable heat-sensitive material of vary-

ing widths substantially uniformly distributed over said substrate whereby to enable transfer of said heat-sensitive material temperature correlated with the optical density of said original image.



3,935,363

ABSORBENT PRODUCT CONTAINING FLOCCULATED CLAY MINERAL AGGREGATES

Nelson D. Burkholder; Ralph L. Wisner, both of Midland, Mich., and Dudley A. Taber, The Hague, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 16, 1974, Ser. No. 506,364
Int. Cl.² B32B *9/00*
U.S. Cl. 428—281 **4 Claims**

1. An article for absorbing aqueous fluids comprising a flexible fibrous support having dispersed therein dry, water stable, flocculated clay mineral aggregates.

3,935,364

POROUS, HEAT-SENSITIVE SUBSTRATES COATED WITH SYNTHETIC RESINS

Emil Proksch, and Helmut Eschweiler, both of Vienna, Austria, assignors to Eternit-Werke Ludwig Hatschek & UCB,S.A., Saint-Gilles-lez-Bruxelles

Continuation-in-part of Ser. No. 194,026, Oct. 29, 1971, abandoned. This application Jan. 11, 1974, Ser. No. 432,487
Claims priority, application Austria, Oct. 30, 1970, 9779/70
Int. Cl.² B05D *3/06*; B32B *3/00*, *13/00*, *21/00*
U.S. Cl. 428—304 **18 Claims**

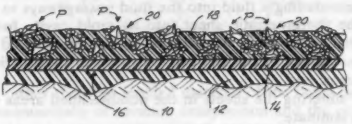
1. An article, comprising a heat-sensitive porous substrate having a smooth, hard resin surface coating thereon, said coating comprising a room temperature cured mixture of (a) 100 parts by weight of at least one saturated synthetic resin which normally has a minimum filmforming temperature higher than room temperature on said porous substrate and (b) 2 to 40 parts by weight of an organic liquid which is a swelling agent for said resin, said liquid consisting of 70 to 10 percent by weight of at least one mono-ethylenically unsaturated compound having a boiling point of less than 190°C. and 30 to 90 percent by weight of at least one ethylenically unsaturated compound having a boiling point of at least 190°C.

3,935,365

ANTI-SKID AND WEAR-RESISTING ROAD MARKING TAPE MATERIAL

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Jan. 22, 1974, Ser. No. 435,476
Claims priority, application Italy, Jan. 22, 1973, 19444/73
Int. Cl.² B32B *5/16*
U.S. Cl. 428—323 **15 Claims**



1. As an article of manufacture, a tape material for securement to primer layers provided on roadway pavements so as to form traffic-regulating indicia on the latter, comprising a first layer which contains a polymeric binder having high molecular cohesion, said first layer having one surface adapted to face towards a roadway pavement and another surface adapted to be exposed to traffic; a plurality of hard particles having a minimum hardness of about 6 on the Mohs' Hardness Scale distributed among various levels of said first layer intermediate said surfaces thereof, at least some of said hard particles being provided with a sharp tip; and a second layer adapted to be secured to a primer layer on the roadway pavement bonded to said one surface of said first layer, said second layer being compatible with said first layer so that said first and second layers are firmly bonded to one another, and said second layer also being compatible with the primer layer so as to permit a firm bond to be obtained between said second and primer layers when said tape material is placed on the primer layer, said tape material being effective for imparting good anti-skid properties to a traffic-regulating indicium formed therewith due to the presence of said tips of said hard particles which provide gripping areas when exposed, and said tape material further being effective for maintaining good anti-skid properties during wear of the traffic-regulating indicium due to the distribution of said hard particles among various levels of said first layer which enables fresh hard particles to become exposed as the hard particles next to the latter are removed by wear.

3,935,366

BONDED GOLD ARTICLE COMPOSITION FOR BONDING GOLD TO A CERAMIC SUBSTRATE UTILIZING COPPER OXIDE AND CADIUM OXIDE

Baynard R. Smith, North Palm Beach, Fla., assignor to Electro Oxide Corporation, Palm Beach Gardens, Fla.

Division of Ser. No. 248,014, April 27, 1972, Pat. No. 3,799,891. This application Mar. 22, 1974, Ser. No. 453,568
Int. Cl.² B32B *15/04*; B05D *3/02*
U.S. Cl. 428—328 **41 Claims**

1. A method of bonding a gold layer to a ceramic substrate including the steps of:

a. mixing on a weight basis: (A) about 0.1 to 7.0% of at least one copper oxide powder from the group consisting of cuprous oxide and cupric oxide; (B) about 0.01 to 15.0% of cadmium oxide powder; (C) 78.0 to 99.89% of gold powder having a particle size within the approximate range of 2.0 to 5.0 microns, said copper oxide powder and said cadmium oxide and said gold powder defining in combination a solid composition mixture, said weight percentages of said copper oxide, said cadmium oxide and said gold powder pertaining to said solid composition mixture; and, (D) about 10.0 to 95.0% of an organic binder devoid of glass frits, said organic binder in combination with waid copper powder, said cadmium oxide powder and said gold powder defining a total composition

mixture, said weight percentages of said organic binder pertaining to said total composition mixture;

b. applying said total composition mixture to a ceramic substrate to form a coated ceramic substrate; and

c. firing said coated ceramic substrate at a predetermined temperature within the approximate temperature range of 850°to 1063°C.

3,935,367

METHOD OF RENDERING SURFACES NONFOGGING AND RESULTING ARTICLES

Richard E. Merrill, Wakefield, and Arthur A. Massucco, Natick, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Nov. 24, 1972, Ser. No. 309,332
Int. Cl.² C08G 18/04; C09K 3/18
U.S. Cl. 428—336 27 Claims

1. A method for rendering a surface of a substrate nonfogging, comprising the step of adhering to said surface a thin transparent film of a block copolymer characterized as containing alternating blocks of a hydrophilic polyetherurethane and of a hydrophilic polyacrylic which is a copolymer of a hydroxy-substituted acrylate and an ethylenically unsaturated acid, the weight ratio of said polyetherurethane to said copolymer ranging between about 10 to 90 and about 40 to 60.

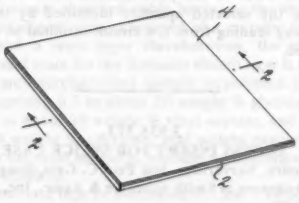
12. An article of manufacture comprising a substrate having on at least one surface thereof a nonfogging, transparent coating comprising a thin transparent film of a block copolymer, the blocks of which are characterized as being a hydrophilic polyetherurethane alternating with a hydrophilic polyacrylic which is a copolymer of a hydroxy-substituted acrylate and an ethylenically unsaturated acid, the weight ratio of said polyetherurethane to said copolymer ranging between about 10 to 90 and about 40 to 60.

3,935,368

VINYL CHLORIDE FLOORING MATERIAL COATED WITH A HYDROPHILIC ACRYLIC POLYMER

Jonas Weiss, Plainfield, N.J., assignor to National Patent Development Corporation, New York, N.Y.

Filed July 1, 1971, Ser. No. 158,824
Int. Cl.² B05D 3/02; B32B 27/08
U.S. Cl. 428—337 2 Claims



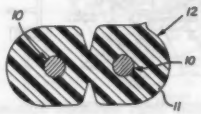
1. A vinyl chloride polymer flooring material, in the form of tile or sheeting, having a thickness of 10 to 500 mils and having a protective outer coating consisting essentially of a hydrophilic acrylic polymer selected from the group consisting of homo polymers of hydroxyethyl acrylate, hydroxypropyl acrylate, hydroxyethyl methacrylate, hydroxypropyl methacrylate, methoxyethyl acrylate, ethoxyethyl acrylate, methoxyethyl methacrylate and ethoxyethyl methacrylate.

3,935,369

METHODS OF MANUFACTURING AN INSULATED CONDUCTOR AND PRODUCT PRODUCED THEREBY

Emanuel John George, Atlanta, Ga.; Joseph Lane Salter, Lutherville, Md.; Earl Salvator Sauer, and Charles Edward Tidd, Jr., both of Baltimore, Md., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 2, 1973, Ser. No. 412,362
Int. Cl.² C08G 45/04
U.S. Cl. 428—379 9 Claims



1. A method of covering a conductive member with a composition which includes a plasticized polyvinyl chloride, an epoxy resin, a stabilizer, a filler system, a flame retardant constituent, and a carbon black constituent, which includes the steps of:

advancing the conductive member along a path;

preheating the conductive member to a temperature within a specified temperature range of approximately 525° to 675°F; and

extruding the composition over the conductive member while the temperature thereof is substantially within the specified temperature range, the temperature being sufficiently high to cause a sufficient chemical reaction of at least one of the constituents of the composition which causes the composition to develop an unexpectedly superior permanent adhesion with the outwardly facing surface of the conductive member, the magnitude of the adhesion being determined at least partially by the temperature to which the conductive member is preheated, further the magnitude of the adhesion being controlled to be consistently within a specified range.

3,935,370

PROCESS FOR PREPARING FLOCK FIBERS FOR ELECTROSTATIC FLOCKING

Toni Marti, Lucerne, Switzerland, assignor to Societe de la Viscose Suisse, Emmenbrucke, Switzerland

Filed Aug. 27, 1973, Ser. No. 391,915
Claims priority, application Switzerland, Sept. 6, 1972, 13114/72
Int. Cl.² B32B 27/02
U.S. Cl. 428—394 13 Claims

1. Process for preparing flock fibers suitable for use in the manufacture of pile materials by electrostatic flocking which comprises treating flock fibers made of polymers selected from the group consisting of polyamides, polyesters, polyacrylonitriles, polyvinyl chloride, and cellulose triacetate with an aqueous solution consisting essentially of tannin and a water-soluble alum, wherein the preparation of said flock fibers excludes any pre-treatment or post-treatment with an aqueous solution containing potassium antimonyl tartrate.

3,935,371

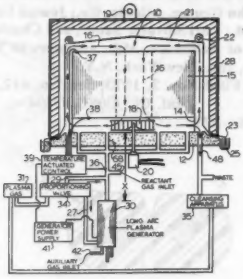
PLASMA HEATED BATCH-TYPE ANNEALING FURNACE

Salvador L. Camacho, O'Neal Road, Raleigh, N.C. 27606, and James K. Magor, 3555 Hamstead Court, Durham, N.C. 27707

Division of Ser. No. 332,919, Feb. 16, 1973. This application June 17, 1974, Ser. No. 480,236

Int. Cl.² H05H *1/26*

U.S. Cl. 13—2 **11 Claims**



1. A modified batch-type annealing furnace converted to plasma arc operation comprising in combination:

a. a basic furnace construction comprising a hearth floor, an inner box-like cover having a closed upper end and a sealable open bottom end adapted to rest about the floor and to provide a treatment chamber to enclose the charge to be annealed, an outer box-like cover having a closed upper end and an open bottom end and a refractory lining therein and being adapted to rest surrounding said inner cover;

b. conduit means providing gas entry paths through said floor and to and from said inner cover chamber;

c. a plasma generator assembly located proximate and external of said furnace construction and including a plasma generator, an electrical power and any necessary cooling supply and a plasma gas supply therefor, the plasma gas output of said gene.ator being connected to said conduit means entry path;

d. temperature control means connected to sense the temperature within said chamber and to control the operation of said assembly whereby upon energization of said generator and the feeding of plasma gas from said supply thereto, a controlled flow of said plasma gas is heated, directed to said chamber and made useful therein as a temperature controlled annealing atmosphere surrounding said charge; and

e. a bypass pipe and valve arrangement connected between said generator plasma gas supply and said generator and controlled by said temperature control means such that said chamber temperature may be controlled by the amount of said plasma gas bypassed around said generator.

3,935,372

METHOD AND APPARATUS FOR MODIFYING WIRE-WRAPPED BACK PLANES

Gerald H. Triplett, Plymouth; Edward A. Nicol, and William G. Klehm, Jr., both of Farmington, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 2, 1974, Ser. No. 494,213

Int. Cl.² H05K *1/04*

U.S. Cl. 174—68.5 **7 Claims**

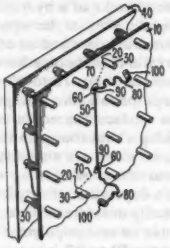
1. The method of effecting wiring changes in the interconnection of the post terminals in a back plane, to thereby modify the operational characteristics of the back plane, said method comprising the steps of:

a. forming a matrix of apertures in a board suitable for receiving a printed circuit, said matrix corresponding to the plurality of post terminals on the back plane,

b. forming a printed circuit on the surface of said board including a plurality of circuit segments, each of said circuit segments partially spanning the distance between a pair of selected apertures corresponding to a pair of post terminals requiring interconnection,

c. forming a pair of circuit terminals at the terminal ends of each of said circuit segments,

d. applying a pair of graphic pathways on the surface of said board for each of said circuit segments, each of said pairs of graphic pathways leading from the circuit terminals of a circuit segment to the said pair of selected apertures partially spanned thereby, each of said pairs of graphic



pathways terminating at and serving to identify a pair of selected apertures corresponding to a pair of post terminals requiring interconnection,

e. affixing one end of a jumper wire to each of said circuit terminals,

f. mounting said board with said printed circuit, said jumper wires and said graphic pathways onto the post terminals of the back plane with each aperture of said matrix of apertures being received over its corresponding post terminal of the back plane, and

g. electrically connecting the free end of each of said jumper wires to the post terminal receivably disposed within the selected aperture identified by the graphic pathway leading from the circuit terminal to which it is affixed.

3,935,373

ACCESS INSERT FOR SPLICE CASE

Bert A. Smith, Northridge, and Paul C. Getz, Saugus, both of Calif., assignors to Smith-Schreyer & Assoc., Inc., Woodland Hills, Calif.

Filed Mar. 4, 1975, Ser. No. 555,297

Int. Cl.² H02G *15/08*

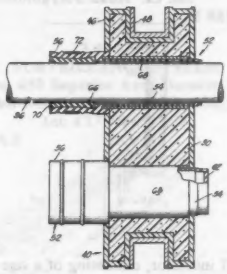
U.S. Cl. 174—77 R **8 Claims**

1. An access insert for a splice case comprising

a first resilient tube;

a rigid sleeve positioned about at least a portion of said first

resilient tube;
a closed end at a first end of said first resilient tube; and



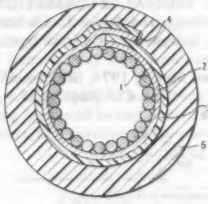
a second resilient tube, said second resilient tube extending from about a second end of said first resilient tube.

3,935,374

LAMINATED SHEATHED CABLE

Kanji Yoshikawa; Yoshiharu Tatsukami, both of Nilhama; Hiroshi Shimba, and Hiroaki Mukunashi, both of Yokohama, all of Japan, assignors to Sumitomo Electric Industries, Ltd. and Sumitomo Chemical Company, Ltd., both of Osaka, Japan

Filed Dec. 18, 1972, Ser. No. 315,965
Claims priority, application Japan, Dec. 18, 1971, 46-102819
Int. Cl.² H01B 7/22; B32B 7/00
U.S. Cl. 174—102 R **5 Claims**



1. A laminate sheathed cable having as the shielding layer a laminate sheath tape composed of a metallic foil, an outer jacket, and a resin layer therebetween, the improvement wherein said resin for the laminate sheath tape is an ethylene-glycidyl methacrylate-vinyl acetate terpolymer, said terpolymer comprising 0.5 to about 20 weight % glycidyl methacrylate, 0.5 to about 20 weight % vinyl acetate, and about 60 to about 99 weight % ethylene, said weight percentages being based on the total weight of glycidyl methacrylate, vinyl acetate and ethylene.

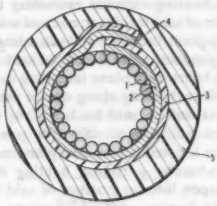
5. A laminate tape of a metallic foil and a terpolymer resin coated on one or both surfaces of said metallic foil, said resin consisting of an ethylene-glycidyl methacrylate-vinyl acetate terpolymer wherein said glycidyl methacrylate is used in amounts of 0.5 to about 20 weight %, said vinyl acetate in amounts of 0.5 to 20 weight %, and said ethylene in amounts of about 60 to about 99 weight %, said weight percentages being based on the total weight of glycidyl methacrylate, vinyl acetate and ethylene.

3,935,375

LAMINATE TAPE AND LAMINATE SHEATHED CABLE

Terumichi Ichiba; Hiroshi Shimba, and Hiroaki Mukunashi, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 14, 1973, Ser. No. 359,944
Claims priority, application Japan, May 13, 1972, 47-47332; May 27, 1972, 47-52603; May 27, 1972, 47-52604
Int. Cl.² H01B 7/22; B32B 7/00
U.S. Cl. 174—102 R **20 Claims**



1. A laminate sheathed cable including a laminate tape composed of a metal foil and a terpolymer resin coated on one or both surfaces of the metal foil, the terpolymer resin having a metal index of below about 15 and consisting of (a) a first component of at least 25 weight percent ethylene; (b) a second component selected from glycidyl methacrylate, glycidyl acrylate and allyl glycidyl ether; and (c) a third component selected from an alkyl acrylate and an alkyl methacrylate, said laminate tape being formed on a cable core in the form of a tube such that both ends of the laminated tape are united.

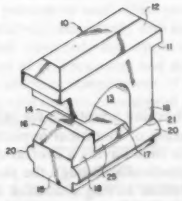
11. A laminate tape of a resin and a metal foil adapted to be formed on a cable core in the form of a tube, both ends of said laminate tape capable of being united, characterized in that a terpolymer resin having a melt index below about 15 and consisting of (a) a first component of at least 25 weight percent ethylene; (b) a second component selected from glycidyl methacrylate, glycidyl acrylate and allyl glycidyl ether; and (c) a third component selected from an alkyl acrylate and an alkyl methacrylate, is used as the resin, said resin being coated on one or both surfaces of the metal foil.

3,935,376

CERAMIC INSULATOR FOR SUPPORTING A RIBBON-TYPE HEATING ELEMENT

Leland L. Cooper, Cabbot, and Darl L. Beer, Sarver, both of Pa., assignors to Du-Co Ceramics Company, Saxonburg, Pa.

Filed Dec. 18, 1974, Ser. No. 533,810
Int. Cl.² H01B 17/56; H05B 3/02, 3/32
U.S. Cl. 174—138 J **3 Claims**



1. A ceramic insulator for supporting a ribbon heating element within an electric resistance heater; said insulator having spaced sidewalls, a front wall and a back wall; a pair of mounting shoulders located at the upper end of said insulator for supporting said insulator in a heater, one of said mounting shoulders extending outwardly from the front wall of said insulator and the other of said mounting shoulders extending outwardly from the back wall of said insulator; a passageway

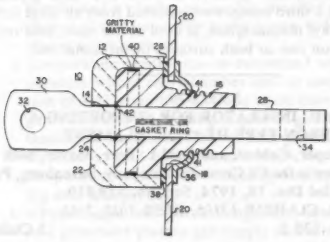
extending through said insulator between said spaced sidewalls to form an open interior portion within said insulator adapted to receive a ribbon heating element; said front wall of said insulator having a substantially horizontally extending slot formed therein connecting with said open interior portion of said insulator to provide access to said open interior portion for insertion of a ribbon heating element into said open interior portion; a flat bearing surface located between said spaced sidewalls and forming the bottom of said passageway, said bearing surface located in a plane below a plane including the bottom of said slot, said bearing surface adapted to support a ribbon heating element extending through said open interior portion of said insulator; each of said spaced sidewalls having an elongated radiused rib extending outwardly therefrom, the longitudinal axis of each of said ribs being parallel to and located below said plane including said bearing surface, each of said ribs extending along one of said spaced sidewalls from said front wall to said back wall of said insulator, the curved surface of each of said ribs providing a rounded contact surface located below said plane including said bearing surface, whereby a ribbon heating element extending through said open interior portion of said insulator and supported by said bearing surface contacts a portion of said rounded surface of each of said ribs to minimize abrasive wear between said insulator and the ribbon heating element during expansion and contraction of the ribbon heating element.

3,935,377

ELECTRICAL BUSHING COMPRISING A RESIN BODY AND A CERAMIC OUTER SHELL

James R. Gamble, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 24, 1974, Ser. No. 536,068
Int. Cl.² H01B *17/26, 17/32*
U.S. Cl. 174—153 R **4 Claims**



1. An electrical bushing adaptable for insertion through an aperture in the casing of electrical apparatus comprising, a cup-shaped ceramic shell having a central opening, a conductor extending longitudinally through the shell and the central opening, the conductor having a smaller diameter than the central opening, a body of epoxy resin occupying the interior of the shell and adhering to the conductor and to the shell, the resinous body including a portion extending out of the side of the shell opposite the central opening and around the conductor, the combination of said portion and the conductor being insertable through the aperture and into the casing of electrical apparatus, the conductor and the epoxy resinous body have corresponding coefficients of expansion, and means on said portion for detachably mounting the bushing in place.

3,935,378

STAND-OFF INSULATORS

Herbert Frank Heyden, Pelham, N.Y., assignor to Union Plastics Corporation, Springfield, N.J.

Filed May 17, 1974, Ser. No. 470,750
Int. Cl.² H01B *17/14*
U.S. Cl. 174—158 R **10 Claims**

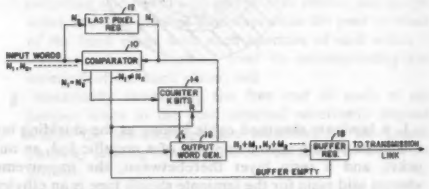
1. A stand-off insulator, consisting of a one-piece body of electrically non-conductive material having an elongated portion provided with a pair of opposed free end regions at one of which said body has a means for releasably fixing to said one free end region an article such as a clamp, bracket, or the like, and at the other of which said body has a means for mounting said body on a support with said elongated portion extending in a given direction with respect to said support, said mounting means including a flange of substantially L-shaped configuration having one wall projecting from said elongated portion at said other free end region thereof inwardly of an extremity of said other free end region so that said elongated portion extends past and beyond said one wall of said flange up to said extremity of said other free end region of said elongated portion, said flange having a second wall extending angularly from said one wall thereof to be directly fastened to a support.

3,935,379

METHOD OF AND SYSTEM FOR ADAPTIVE RUN LENGTH ENCODING OF IMAGE REPRESENTING DIGITAL INFORMATION

Daryl D. Thornburg, and James L. Christensen, both of San Diego, Calif., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed May 9, 1974, Ser. No. 468,789
Int. Cl.² H04N *1/38*
U.S. Cl. 178—6 **15 Claims**



1. The method of increasing the information density of digital data which represents an image, comprising the steps of:

a. comparing consecutive pairs of digital signals which represent different pixels of said image,

b. counting the number of said consecutive pairs, each of the signals of which are identical, and

c. upon occurrence of each of said consecutive pairs which is constructed of signals which are different, encoding the number which is counted before said occurrence into

i. a first digital data word having a given number of digits representing the first signal of the consecutive pair which is constituted of different signals and a portion of said counted number which is actually a part thereof, and

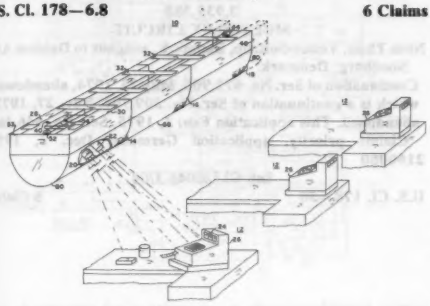
ii. into additional digital words for any remaining portions of said last named number which are also actually parts thereof and which are greater than zero, which additional words each having said given number of digits and representing said first signal and different ones of said remaining portions.

3,935,380

SURVEILLANCE SYSTEM

John M. Coutta, 450 Superior Ave., Decatur, Ga. 30030

Filed Dec. 6, 1974, Ser. No. 530,133
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 6 Claims



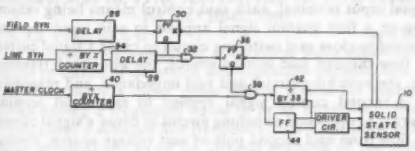
1. A surveillance system for viewing a plurality of spaced, in-line stations comprising:
an elongated carriage track positioned along a line parallel to the line of said stations;
a carriage adapted to be supported by and be movably operated on said track;
drive means for selectively positioning said carriage along said track;
a television camera supported by said carriage;
first training means for rotating said camera horizontally and second training means for tilting said camera;
display means for displaying the output of said camera;
control means for selectively operating said drive means and for operating said first and second training means whereby said camera may be positioned to selectively view said stations; and
a semi-circular partially opaque, but otherwise transparent, cover extending from end to end of said system and covering said camera and carriage as they are moved end to end.

3,935,381

ELECTRONIC SOLID STATE SENSOR IMAGE SIZE CONTROL

Edward A. Petrocelli, Sunrise, Fla., and Anthony C. H. Louie, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1974, Ser. No. 482,393
Int. Cl.² H04N 5/30
U.S. Cl. 178—7.1 4 Claims



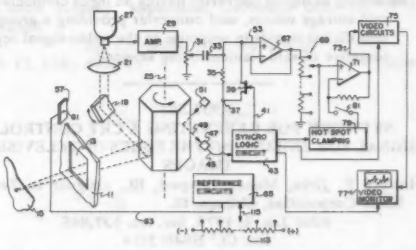
1. An electronic control system for generating scanning clock signals to control the scanning rate of a solid state sensor to read out the video information and control the image size reproduced on a TV monitor comprising:
a. s source of clock frequencies,
b. timing circuit means for providing a field synchronizing pulse output and a line synchronizing pulse output;
c. first counter circuit means coupled to said source of clock frequencies to provide a scanning clock signal of a predetermined frequency determined by a desired picture size,
d. delay circuit means coupled to said timing circuit means for delaying the field and line synchronizing pulses a predetermined time delay,
e. variable gate generator circuit means coupled to said delay circuit means and to said first counter means for gating a predetermined number of clock pulses to said solid state sensor corresponding to the size of the sensor array,
f. feedback circuit means coupled from said sensor to said variable gate generator circuit means for providing a feedback signal to turn off said variable gate at the end of said predetermined time.

3,935,382

THERMOGRAPH ABSOLUTE TEMPERATURE REFERENCING TECHNIQUE

Robert P. Hunt, Menlo Park, Calif., assignor to Spectrotherm Corporation, Santa Clara, Calif.

Filed Mar. 4, 1974, Ser. No. 447,960
Int. Cl.² H04N 3/16
U.S. Cl. 178—7.1 9 Claims



1. In a thermograph instrument that is characterized by a reference temperature target adjacent an optical field to be viewed, means for scanning and detecting an infrared energy component of the optical field in two dimensions with a portion of the reference target periodically being scanned and detected thereby, electronic video processing circuits receiving a time varying output of said detector means that is proportional to the infrared intensity of the optical field, and means synchronized with said scanning and detecting means for referencing a portion of said video processing circuits to a reference potential simultaneously with said reference target being scanned and detected, the improvement comprising means independent of said scanning and detecting means and responsive to the absolute temperature of said reference target for developing said reference potential proportional to the target absolute temperature.

3,935,383

STORAGE OF A REPRESENTATION OF AN IMAGE

John H. Newitt, 123 Puritan Lane, Sudbury, Mass. 01776

Filed July 19, 1974, Ser. No. 490,035
Int. Cl.³ H04N 5/38
U.S. Cl. 178—7.2 1 Claim

1. In apparatus for providing groups of digital signals respectively representative of elements of an image on an image bearing medium being scanned by a video generator which generates a video signal having an amplitude representative of an element being scanned, said scanning being in response to

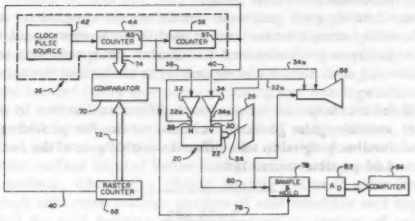
deflection signals provided to said generator by a deflection circuit which stores digital signals representative of a coordinate of the location of said element being scanned, the improvement comprising:

a raster counter connected to said deflection circuit for providing count signals representative of a number of times said generator scans said image;

comparison means connected to said deflection circuit and to said raster counter for providing a gating signal when said count signals have a known relationship to said coordinate;

storage means connected to said comparison means and said generator for storing the video signal representative of said element being scanned when said gating signal is provided; and

an analog to digital converter having an input connected to said storage means, said converter providing a group of said digital signals in response to the video signal representative of said element being scanned.

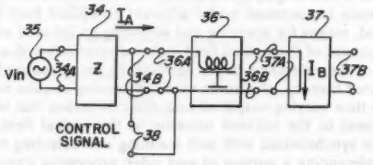


3,935,384

NETWORK FOR GENERATING A CRT CONTROL SIGNAL FOR ENHANCING THE EDGES OF TELEVISION IMAGES

Howard F. Jirka, Mount Prospect, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 2, 1975, Ser. No. 537,865
Int. Cl.² H04N 5/14
U.S. Cl. 178—7.5 R 5 Claims



1. In a television receiver, a network for receiving a video signal and generating therefrom both a delayed video signal for intensity modulating a CRT electron beam with picture information and a control signal for modulating the scan velocity of the CRT electron beam so as to enhance the sharpness of the television image, said network comprising, in cascade:

impedance means having an input port and an output port;

delay means having an input port and an output port with its input port coupled to the output port of said impedance means, the impedance means having an impedance at its output port which is substantially equal to the characteristic impedance of the delay means;

a reflecting termination coupled to the output port of said delay means, which termination is reflective of signals received from said delay means and in the frequency range of the video signal;

means for applying the video signal to the input port of said impedance means;

an output terminal at a point between said impedance means and said delay means from which the control signal is taken; and

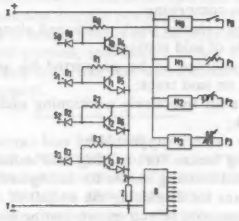
means responsive to the signal received by the reflecting termination from said delay means for generating a signal for use as the delayed video signal which is substantially proportional to the signal received by the reflecting termination.

3,935,385

MULTIPLEX CIRCUIT

Niels Thun, Vester-Sottrup, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 472,905, May 23, 1974, abandoned, which is a continuation of Ser. No. 309,704, Nov. 27, 1972, abandoned. This application Feb. 3, 1975, Ser. No. 546,462
Claims priority, application Germany, Dec. 3, 1971, 2160080
Int. Cl.² H04J 3/04
U.S. Cl. 178—50 8 Claims

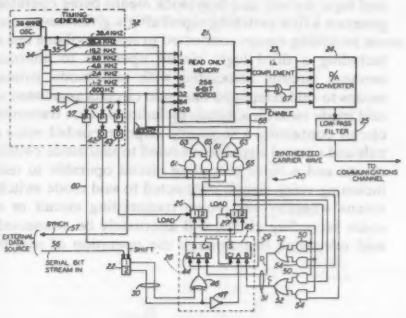


1. A multiplex circuit comprising a plurality of signal-current transmitters each of which in a predetermined working range is substantially independent of voltage and each of which has first and second terminals, a measuring impedance common to all said transmitters and having first and second terminals, a central voltage source having first and second poles, said first pole being connected to said first terminal of said impedance and said second pole being connected to said first terminal of each of said transmitters, and switching means comprising for each said transmitter a respective switching circuit having a first terminal connected to said second terminal of said transmitter and a second terminal connected to said second terminal of said impedance, each said switching circuit having a respective control means connected to said first terminal of the switching circuit and provided with a switching signal input terminal, each said control means being responsive to a first control signal applied to said input terminal thereof to close said switching circuit to cause a signal current to flow through said voltage source, the associated transmitter, the switching circuit and said impedance, and responsive to a second control signal applied to said input terminal thereof to open said switching circuit to cause a signal current to flow from said second pole of said voltage source, through the associated transmitter and direct from said first terminal of said switching circuit to said first pole of said source, whereby said signal current does not flow through said impedance.

3,935,386
APPARATUS FOR SYNTHESIZING PHASE-MODULATED CARRIER WAVE

Jerry Marshall Glasson, Skokie, and Harold Louis Kabb, Glenview, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Sept. 20, 1974, Ser. No. 508,021
Int. Cl.² H04L 27/20
U.S. Cl. 178—67 **28 Claims**



1. Apparatus for synthesizing a phase-modulated carrier wave according to digital data elements sequentially applied thereto, comprising:

a memory for storing a plurality of predefined carrier-wave segments, each segment having a unique phase and being represented by a set of a plurality of digitally encoded samples;

means for selecting, according to the current data element and the phase of the last selected carrier-wave segment, the next carrier-wave segment to be read from the memory;

means for addressing the memory to sequentially read the samples representing each selected carrier-wave segment; and

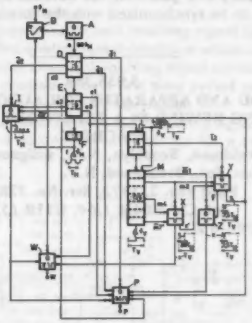
means connected to the output of the memory for combining at least some of the samples of the last selected carrier-wave segment with at least some of the samples of the next selected carrier-wave segment to generate the phase-modulated carrier wave at the output of the combining means as successive samples are applied by the memory thereto.

3,935,387
PULSE GENERATOR FOR TELEVISION FOR GENERATING AT LEAST ONE PULSE SERIES HAVING PULSES OF DIFFERENT DURATION AND REPETITION PERIOD

Eugenius Martinus Kaptein, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 122,973, March 10, 1971, abandoned. This application Jan. 2, 1973, Ser. No. 319,984
Claims priority, application Netherlands, Mar. 14, 1970, 7003669; May 16, 1970, 7007169; Oct. 10, 1970, 7014894
Int. Cl.² H04L 5/06
U.S. Cl. 178—69.5 G **21 Claims**

1. A circuit for generating a television pulse series having pulses of different durations and repetition periods, said circuit comprising a clock pulse source means for supplying pulses having a frequency equal to or an integer multiple of eighty times a selected line frequency, said clock pulse period being substantially to or an integral multiple of the highest common factor of said different pulse periods, the shortest repetition period of said pulses of said series being an integral multiple of said clock pulse period, a plurality of frequency dividers coupled to said clock, a plurality of pulse generators each coupled to at least one of said dividers for control of said generators, a first signal generator having a plurality of inputs

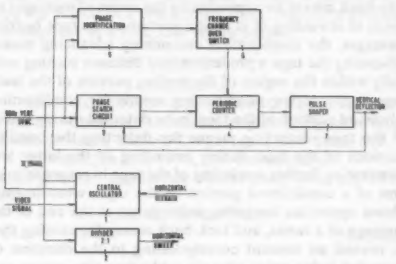


coupled to said pulse generators and dividers and an output means for supplying at least part of said pulse series.

3,935,388
CIRCUIT ARRANGEMENT FOR SYNCHRONIZING A TELEVISION RECEIVER

Uwe Brinkmann, Nellingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,379
Claims priority, application Germany, Oct. 18, 1973, 2352355
Int. Cl.² H04L 7/00; H04N 5/04
U.S. Cl. 178—69.5 TV **4 Claims**



1. A synchronizing circuit, for providing synchronized horizontal and vertical deflection control signals in a television receiver in a TV system of the type wherein a composite video signal including horizontal and vertical sync pulses is received by the receiver, comprising the combination of:

an oscillator providing a signal at a frequency equal to a multiple of the frequency of the horizontal deflection of the video signal, said oscillator being synchronized by the horizontal sync pulses;

a frequency dividing means for receiving said oscillator signal, dividing its frequency by said multiple and providing said horizontal deflection control signal;

a periodic counter connected to receive the oscillator signal and provide an output when a final count is reached, said output being a vertical deflection control signal and having a frequency equal to the frequency of the oscillator signal divided by the final count value of the counter;

blanking gate means for comparing the vertical deflection control signal with the received vertical sync signal and providing a blanking gate control signal to said periodic counter in response thereto; and

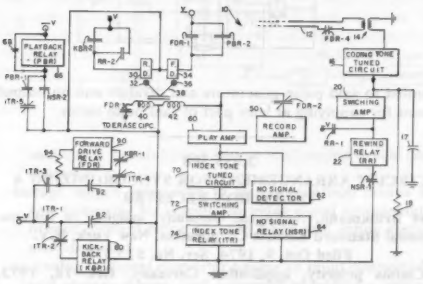
switch gate means to compare the vertical deflection control signal and vertical sync pulses to switch the periodic

counter into one of two final counting conditions, whereby the blanking and switch gate means enable the frequency and phase of the vertical deflection control signal to be synchronized with the received vertical sync signal.

3,935,389
METHOD AND APPARATUS FOR AUTOMATICALLY LIMITING REWIND IN A TELEPHONE ANSWERING MACHINE

Herbert Waldman, Brooklyn, N.Y., assignor to Quasar Microsystems, Inc., Brentwood, N.Y.

Filed Feb. 2, 1973, Ser. No. 328,900
Int. Cl.² H04M *1/64*; G11B *15/20*
U.S. Cl. 179—6 E **6 Claims**



1. In a telephone answering apparatus coupled to telephone lines having recording means for recording a series of messages on a tape, rewind means for rewinding the tape, and play-back means for reproducing the series of messages subsequent to rewinding of at least a portion of the tape bearing the messages, the combination comprising advancing means for advancing the tape a predetermined distance starting substantially within the region of the trailing portion of the last message in the series; conditioning means for conditioning the advanced portion of the tape to be detected during rewinding of the tape; detecting means for detecting the conditioned portions of the tape during rewinding of the latter and for terminating further rewinding of the tape in response to detection of a conditioned portion of the tape; wherein the telephone apparatus recording index tones at the end of the last message of a series, and kick-back means for causing the tape to rewind an amount corresponding to the duration of the recorded index tone, wherein said advancing means cooperates with said kick-back means to commence advancement of the tape subsequent to kick-back.

3,935,390
TELEPHONE ANSWERING AND MESSAGE RECORDING APPARATUS

David R. Winterhalter, Berkeley, Calif., assignor to Sontel Inc., Alamo, Calif.

Filed June 4, 1973, Ser. No. 366,791
Int. Cl.² H04M *1/64*
U.S. Cl. 179—6 R **6 Claims**

1. A telephone answering and recording device adapted to be operated in a conversation mode with the caller and to be connected to a telephone line comprising:

a ring detector circuit operably connected to a telephone line to receive signals therefrom;

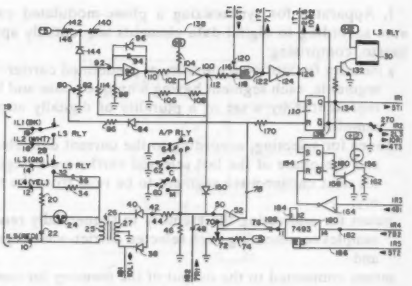
a first logic circuit connected to said ring detector circuit including a switching means operable to initiate operation of said device when it receives signals from said ring detector circuit and to deactivate said device when it receives a deactivation signal;

a pulse detecting means connected to receive voice signals form said telephone line when operation of said device has been initiated and operable to generate a timing reset signal each time a predetermined pulse level is received;

a second logic circuit connected to said pulse detecting means and adapted to pass said timing reset signal generated by said pulse detecting means, and operable to generate a continuous timing reset signal until at least one timing reset signal is received for each voice-receive cycle;

a first clock means connected to said second logic circuit to receive said timing reset signal when passed by said second logic circuit; said first clock means being operable to generate a first switching signal after a given timing cycle;

mode switching means connected to said telephone line and including a third logic circuit operable to alternately connect circuits associated with said mode switching means to said telephone line, said circuits associated with said mode switching means including a voice transmitting circuit containing a sequence of pre-recorded voice signals and control signals connected to said mode switching means and a voice recording circuit operable to record incoming voice signals connected to said mode switching means whereby said voice transmitting circuit or said voice recording circuit will alternately be connected to said telephone line through the operation of said third



logic circuit respectively by said first switching signal or a second switching signal;

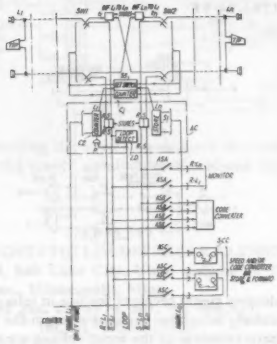
a control signal detector circuit means connected to said voice transmitting circuit and adapted to generate said second switching signal upon detection of one of said pre-recorded control signals of said voice transmitting circuit, said control signal detector circuit being connected to said third logic circuit to apply said second switching signal generated thereby to said third logic circuit, said first switching signal generated by said first clock means will cause said third logic circuit to switch said mode switching means to connect said voice transmitting circuit to said telephone line and said second switching signal generated by said control signal detector circuit will cause said third logic circuit to switch said mode switching means to connect said voice recording circuit to said telephone line thereby allowing a conversation to occur between said device and a caller based upon pauses in the voice signals causing said voice transmitting circuit to send each of said pre-recorded voice signals of said sequence over said telephone line at intervals determined by the presence of and lack of voice signals on said telephone line provided that the caller responds to some of said pre-recorded voice signals of said sequence of pre-recorded voice signals when said device is operating.

3,935,391

TIME DIVISION MULTIPLEX SWITCHING SYSTEM

Donald Adams Weir, Goff's Oak, and William Arthur George Walsh, New Barnet, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 8, 1974, Ser. No. 486,596
Int. Cl.² H04J 3/00
U.S. Cl. 179—15 A 6 Claims



1. An automatic telecommunication switching center comprising, means coupling lines to a storage array, said lines carrying communication channels set up in TDM manner with each said channel allocated a time slot in the TDM cycle, said storage array including a storage compartment per channel served, each of said storage compartments including an "in" section and an "out" section in which intelligence incoming to the center over one of the channels is recorded directly into that channel's "in" section, in which when a connection is set up between a first and a second channel each of those channels' "in" sections has recorded in it the storage address of the other of those channels plus the intelligence to be sent to that other channel, in which when the compartment for said first channel is scanned during said connection the intelligence in that channel's "out" section is read out to that channel and the contents of that first channel's "in" section is extracted and transferred to the second channel's "out" section under control of the address in that "in" section, in which the intelligence thus extracted from said first channel's "in" section is replaced by intelligence newly received from said first channel, in which when the compartment for said second channel is scanned during said connection the intelligence in that channel's "out" section is read out to the said second channel and the contents of that second channel's "in" section is extracted and transferred to the first channel's "out" section under control of the address in the second channel's "in" section, and in which the intelligence thus extracted from said second channel's "in" section is replaced by intelligence newly received from said second channel.

3,935,392

DIAL PULSE DETECTION METHOD AND APPARATUS

Lloyd M. Smith, and Robert E. Webb, both of 3771 Harts Mill Lane, Atlanta, Ga. 30319

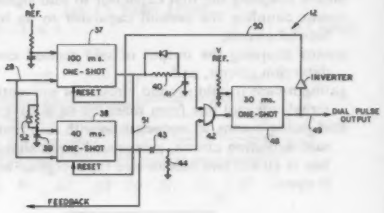
Filed Jan. 17, 1974, Ser. No. 434,013
Int. Cl.² H04Q 1/36
U.S. Cl. 179—16 EA 13 Claims

1. Apparatus for detecting the occurrence of a dial pulse signal which consists of first and second signal portions separated by a known period of time and having characteristic transient signal conditions, comprising:

means for receiving input signals which may include as dial pulse signal and operative in response to each input signal which exhibits such characteristic transient signal conditions to provide an enabling signal condition which denotes the occurrence of what may be one of such dial pulse signal portions;

first means responsive to said enabling signal condition to provide a first control signal condition which commences a delayed time after said enabling signal condition occurs and which continues for a first time period substantially equal to a complete dial pulse signal;

second means responsive to said enabling signal condition to provide a second signal condition for a second time



period equal to at least a portion of such known separation time between the first and second signal portions of a dial pulse signal; and

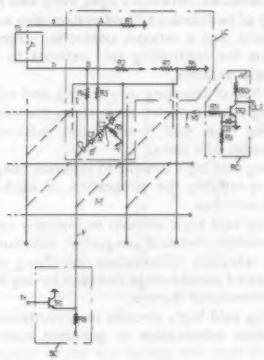
coincidence means responsive to the initiation of a said second control signal condition at a time when a said first control signal condition is present to provide an output signal condition corresponding to the occurrence of a dial pulse, so that such output signal conditions can occur only when a second control signal condition provided in response to a second such signal portion is initiated during the period of a first control signal condition provided in response to a first such signal portion.

3,935,393

LINE CONDITION SIGNALLING SYSTEM

Rene Marcel Vancoillie, Meulebeke, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,236
Claims priority, application Netherlands, Feb. 12, 1973, 7301959
Int. Cl.² H04M 3/22
U.S. Cl. 179—18 FA 6 Claims



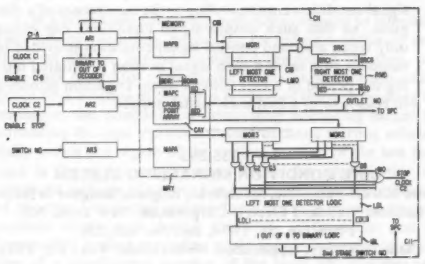
1. A line condition signalling system including at least one line;

a line loop forming means;
a signal source generating input signals;
a detection circuit to detect the condition of said line;
a line loop evaluating circuit passing or blocking said input signals depending on the condition of said line and including a first and a second circuit;
said first circuit comprising a series connection of a first capacitor, a diode and a second capacitor;
means including first and second terminals coupling said diode to said line to enable bias of the diode in accordance with the conditions of the line;
means coupling the first capacitor to said signal source,
means coupling the second capacitor to an input of said second circuit,
means coupling the output of said second circuit to said detection circuit, and
gating means in said second circuit for preventing spurious signals on said line from reaching its output, whereby
said gating means, in cooperation with said first circuit and said detection circuit, passes said input signals when the line is closed and blocks said input signals when the line is open.

3,935,394
NETWORK ROUTING AND CONTROL ARRANGEMENT

Andrew Frederick Bulfer, Oceanport, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 4, 1974, Ser. No. 512,256
Int. Cl.² H04Q 3/54
U.S. Cl. 179—18 ES **5 Claims**



1. In a system having a two-stage network with a plurality of links connected between stages, each said stage comprising a plurality of switches, and said system also having a memory, logic circuits, and a network controller responsive to control information for controlling said network to establish a path through said network,

the method of selecting, controlling, and establishing a path through said network comprising the steps of

retrieving from said memory link information specifying accessible idle links,

operating said logic circuits to generate congestion information specifying the congestion of each of said second stage switches,

operating said logic circuits to logically combine said link information and said congestion information to generate path selection information specifying one of the least congested second-stage switches having an accessible idle link connected thereto,

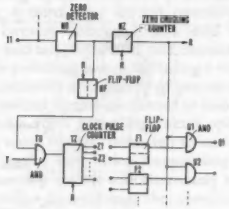
operating said logic circuits in accordance with said path selection information to generate control information, and

applying said generated control informaton to said network controller to establish the path through said network via a first-stage switch, said specified one least-congested second-stage switch and said accessible idle link connected thereto.

3,935,395
SELECTIVE SIGNAL RECEIVER FOR USE IN TELECOMMUNICATION SYSTEMS

Herbert Ball, Stuttgart, and Wolf Ohl, Korntal, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,287
Claims priority, application Germany, Aug. 16, 1973, 2341225
Int. Cl.² H04M 1/50
U.S. Cl. 179—84 VF **5 Claims**



1. A selective signal receiver for use in telecommunication and particularly telephone systems wherein the time distances between zero crossings of the input voltage are measured with a counter which is controlled at a clock frequency higher than the signal frequency to be determined, and wherein the input voltage is evaluated as a signal only if the measured value lies between a lower and an upper count determining the bandwidth, wherein the improvement comprises a zero crossing detector coupled to provide a pulse each time the input voltage crosses zero, a zero crossing counter coupled to the zero crossing detector to count a predetermined number of said pulses indicating zero crossings of an input signal and the zero crossing counter providing a reset signal when that number is reached, a clock pulse counter coupled to start when the pulse including the first zero crossing occurs, where the lower count and the upper count of the clock pulse counter are chosen depending on the predetermined number of cycles, on the predetermined tolerances of the signal frequencies, and on permissible interference-voltage components.

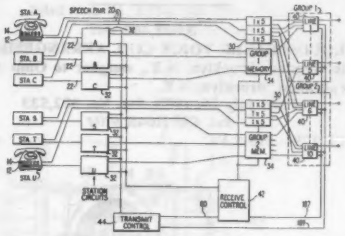
3,935,396
KEY TELEPHONE SYSTEM USING TIME DIVISION AND SPACE DIVISION CONTROL

John A. Barsellotti; Joseph H. McNeilly; Federico R. Laliccia, all of Guelph, Canada, and Edouard Pinede, Norwalk, Conn., assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 362,915, May 23, 1973, abandoned.
This application Jan. 23, 1975, Ser. No. 543,479
Claims priority, application Canada, May 23, 1972, 142792
Int. Cl.² H04M 1/00
U.S. Cl. 179—99 **7 Claims**

1. A time division key telephone system including a plurality of groups of key-equipped stations, a plurality of telephone lines and control apparatus for controlling the signalling of the condition of one of said lines to all stations of a group, the invention comprising: an individual station circuit for each of said stations, a pair of data conductors extending between each station and its station circuit for the bi-directional transfer of all control data to and from said station, a pair of speech conductors at each station, a switching network at said control apparatus terminating speech conductors from stations of said group for connection to one of said lines responsive to signals from said control apparatus, and network control means including latch means individual to each station, a memory element representing each such latch means, each said latch means responsive to signal data from a respective one of said station circuits for causing a memory element to store a condi-

tion of a station indicated by the latch means individual thereto, and means responsive to a scan of said memory ele-



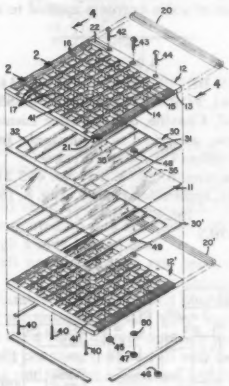
ments for controlling the switching network to complete the connection of the speech conductors of said one station to a line.

3,935,397

ELECTROSTATIC LOUDSPEAKER ELEMENT

Roger A. West, Salt Lake City, Utah, assignor to Electronic Industries, Inc., Minneapolis, Minn.

Filed Jan. 28, 1974, Ser. No. 436,937
Int. Cl.² H04R *19/02*
U.S. Cl. 179—111 R **8 Claims**



1. An electrostatic loudspeaker element, comprising:

a. first and second electrode assemblies, each having:

1. a frame having a generally planar face and having a plurality of web members defining sound passing apertures therebetween, said frame having a plurality of generally parallel wire guiding slots formed in said web members along the face of said frame;
2. a wire wound around said frame in said wire guiding slots to form a wire grid electrode along the plane of the face of said frame;
3. said frame made of material having a coefficient of thermal expansion substantially equal to that of said wire;
4. a dielectric spacer member attached to the face of said frame and having openings aligned with the apertures in said frame and having strip portions aligned with said web members and in contact therewith to confine said wire to said slots;

b. a diaphragm; and

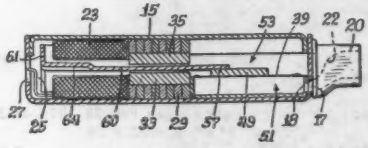
c. means for positioning said diaphragm between said first and second electrode assemblies adjacent said spacer members, whereby said spacer members maintain constant spacing between said wire grid electrodes and said diaphragm, and maintain said wires in position along the planes of the faces of the respective first and second electrode assembly frames.

3,935,398

TRANSDUCER WITH IMPROVED ARMATURE AND YOKE CONSTRUCTION

Elmer V. Carlson, Prospect Heights; August F. Mostardo, Jr., Norridge, and Alex V. Diblick, Elmhurst, all of Ill., assignors to Industrial Research Products, Inc., Elk Grove Village, Ill.

Filed July 12, 1971, Ser. No. 161,825
Int. Cl. H04r *11/00*
U.S. Cl. 179—114 A **3 Claims**



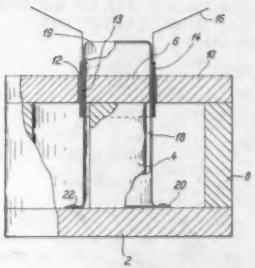
1. An electroacoustic transducer of the magnetic armature type comprising a casing having walls, pole piece means forming an enclosed section, magnets positioned in spaced relation to one another within said enclosed section to form an air gap therebetween, a U-shaped band yoke having a base and two similar arms with the free ends of the arms being connected to said enclosed section, a band armature having one end cantilevered from the base of said yoke to minimize reluctance between said armature and said yoke, the broad surfaces of said armature being transverse to the broad surfaces of said base and arms, a coil, portions of said armature positioned in said coil and in said air gap and the a.c. magnetic flux of said transducer extending through said arms to thereby provide an a.c. flux path having minimum reluctance, said arms being positioned in spaced relation to said walls to separate the casing from the magnetic paths of the transducer, the magnetic paths being within the casing whereby the casing functions as a magnetic shield for the transducer, as a protection against mechanical damage and as an acoustic enclosure.

3,935,399

LOUD SPEAKERS

Ragnar Lian, Cortinavej 27, 8363 Stilling, Denmark

Filed Dec. 12, 1973, Ser. No. 423,896
Claims priority, application Denmark, Dec. 27, 1972, 6465/72
Int. Cl.² H04R *9/00*
U.S. Cl. 179—115.5 VC **7 Claims**



1. A loud speaker of the oscillating coil type including a voice coil associated with a loud speaker membrane and a magnetic circuit having an annular air gap in which the coil is located in such a manner that in its neutral, non-energized condition the coil projects axially from the air gap substantially uniformly to both sides thereof so as to be able to oscil-

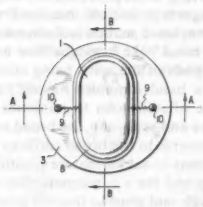
late substantially symmetrically about the middle plane of the air gap, the magnetic circuit including a central member delimiting the inner side of the air gap and disposed in a region extending within the outer end of the voice coil, a cylindric element made of a non-magnetic material of good electrical conductivity being rigidly associated with the magnetic circuit concentrically with the coil and extending into the air gap from one side thereof, characerized in that said cylindric element is extended so as to additionally project outwardly from the air gap to the other side thereof beyond the forward end of the voice coil and the forward end of the central member thereby enabling substantially symmetrical oscillation of the voice coil about the middle plane of the air gap and reduction of sound distortion.

3,935,400

OVAL DOME TYPE SPEAKER

Sigeyuki Koga, Hachioji, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1975, Ser. No. 551,387
Claims priority, application Japan, Feb. 28, 1974, 49-23828
Int. Cl.² H04R 9/02, 9/06
U.S. Cl. 179—115.5 R **9 Claims**



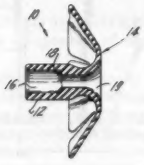
1. A speaker assembly comrising
a dome shaped diaphragm, the cross section along the plane containing the base of said diaphragm having an oval contour;
a voice coil connected to said diaphragm;
magnetic means operatively associated with said voice coil; and
support means for supporting said diaphragm, voice coil and magnetic means.

3,935,401

EARPIECE FOR ACOUSTIC HEADSET

Sidney X. Shore, 29 Wren Drive, Roslyn, N.Y. 11576, and Paul S. Martin, 189-54 43rd Road, Flushing, N.Y. 11358

Filed Aug. 29, 1974, Ser. No. 501,689
Int. Cl.² H04R 1/10
U.S. Cl. 179—182 R **16 Claims**



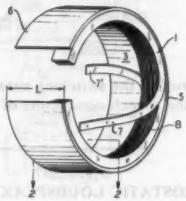
1. An earpiece for an acoustic headset proportioned for cooperating with the wearer's outer ear at the ear canal, said earpiece comprising a tubular portion having a through passage for sound transmission and for receiving an acoustic tube and having a flange portion on an end of the tubular portion, said flange portion being subdivided so as to comprise a plurality of ribs radiating from the tubular portion, the ribs being normally separated by radiating regions of at least reduced thickness.

3,935,402

LOUDSPEAKER VOICE COIL ARRANGEMENT

Martin Gersten, Brooklyn, N.Y., assignor to Ohm Acoustics Corporation, Brooklyn, N.Y.

Filed July 25, 1973, Ser. No. 382,533
Int. Cl.² H04R 9/04
U.S. Cl. 179—115.5 VC **4 Claims**



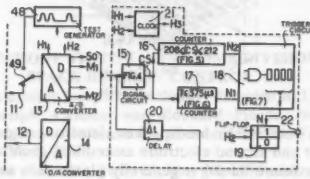
1. A loudspeaker voice coil comprising a winding of anodized rectangular cross section aluminum wire intimately bonded to the inside of an anodized aluminum bobbin for radiating the heat of voice currents applied to said coil.

3,935,403

DEVICE FOR DEVELOPING A NEUTRALIZATION SIGNAL FOR AN ECHO SUPPRESSOR

Etienne Penicaud, Chaville, and Maurice Lienard, Marseille, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Aug. 6, 1974, Ser. No. 495,213
Claims priority, application France, Aug. 8, 1973, 73.29024
Int. Cl.² H04B 3/20
U.S. Cl. 179—170.2 **8 Claims**

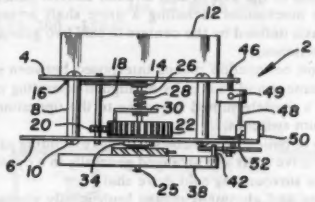


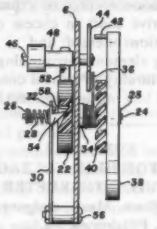
1. Device for developing a neutralization signal for an echo suppressor, necessary for the transmission of data on a telephone line having four wires, each transmission of data being preceded by an identification signal at a given frequency, said device comprising first counter means for producing a first neutralization condition when the time between two zeros of a line signal does not exceed a preestablished value, second counter means for counting changes in sign of said line signal during a predetermined period, said second counter means producing a second neutralization condition when the state of said second counter means at the end of said period is between two predetermined limits, and circuit means for triggering a flip-flop providing a neutralizing signal, said circuit means combining said two neutralization conditions, and said circuit means comprising shift register means for triggering said flip-flop only when said neutralization conditions are combined several times in succession and said line signal is at a level greater than a predetermined minimum value.

3,935,404
TIMER SWITCH ASSEMBLY

Holger Persson, 5941 Emerson Ave. S., Minneapolis, Minn. 55430

Filed Oct. 21, 1974, Ser. No. 516,794
Int. Cl.² H01H 43/00
U.S. Cl. 200—35 R 9 Claims





1. Apparatus for operating an electrical switch in a random fashion comprising in combination;

a. first and second mounting plates maintained in a parallel and spaced relationship with one another.

b. a motor mounted on said first plate with its rotor extending through a hole in said plate;

c. a first shaft passing through said second plate and journaled for rotation and translation therethrough;

d. a gear rotatably mounted on said first shaft between said first and second plates, said gear having an aperture formed in the surface thereof opposite to said first plate;

e. a gear train coupling the rotor of said motor to said gear for driving said gear at a constant rotational speed;

f. a leaf-spring mounted at one end to said second plate and having a projection at the other end for normally maintaining said leaf-spring in a flexed condition except when said projection mates with said aperture in said gear, said leaf spring being coupled to said first shaft to cause said shaft to assume a first translational position when said spring is in a flexed condition and a second translational position when said spring projection mates with said aperture in said gear;

g. a disc rotatably mounted on the portion of said first shaft extending through said second plate, said disc. having a pin located at a predetermined radial distance from the axis of said first shaft;

h. means coupling said gear to said disc when said shaft is in its first translational position for imparting rotational motion to said disc as said gear is driven by said gear train;

i. a cam mounted for rotation on a second shaft between said first and second plates and having a portion of said second shaft extending through a hole in said second plate;

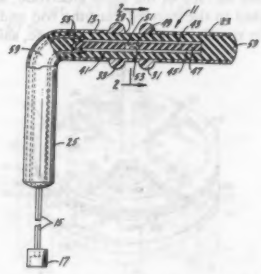
j. a star-wheel affixed to said portion of said second shaft and normally oriented in the orbital path traversed by said pin as said disc is rotated; and

k. a microswitch mounted on said second plate having its actuator arm cooperating with said cam.

3,935,405
MOUTH HELD SWITCH ASSEMBLY

William F. Auer, Des Plaines, Ill., assignor to Willmark Products Company, Rosemont, Ill.

Filed Jan. 10, 1975, Ser. No. 539,979
Int. Cl.² H01H 35/00
U.S. Cl. 200—52 R 7 Claims



1. A mouth held switch assembly for actuating an electrically operated surgical instrument, which switch can be operated only by clamping movement of the front incisors of the user, said switch assembly including:

an elongated tubular housing having a handle portion and a actuating portion,

electrical leads extending out of said handle portion of said housing,

connecting means at the free ends of said electrical leads for connection to a surgical instrument,

an electric switch having a pair of blades is positioned in said actuating portion of said housing and extends lengthwise thereof with each of said blades connected to an electrical lead of said switch assembly,

said blades being mounted in spaced relationship to each other for movement towards and away from each other,

contacts carried by the blades and engagable with each other upon movement of the blades toward each other,

a transversely extending weakened area formed and located in said actuating portion of said housing adjacent said contacts to permit force applied to said weakened area of said housing to move said conductors towards each other,

said weakened area of said housing being spaced from the end of the actuating portion of said housing a distance such that the front incisors of the user can engage said weakened area when said actuating portion is held in the user's mouth, and

guards formed as parts of said actuating portion and located on opposite longitudinal sides of said weakened area,

said guards being spaced apart a sufficient distance to permit access to said weakened area of said housing only by the front incisors of said user when the actuating portion of housing is positioned in the user's mouth.

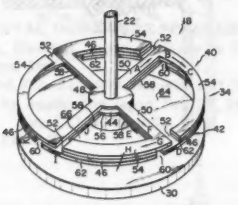
3,935,406
VACUUM INTERRUPTER

Minoru Murano, Tokyo; Satoru Yanabu, and Hitoshi Sodeyama, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 25, 1974, Ser. No. 482,901
Claims priority, application Japan, June 30, 1973, 48-74202
Int. Cl.² H01H 9/30, 33/00
U.S. Cl. 200—144 B 5 Claims

1. A vacuum interrupter comprising a vacuum vessel; a pair of current carrying rods extending in an airtight fashion from

the vacuum vessel and connected to an exterior electrical path to permit a main electric current to be passed therethrough; a pair of electrode units, each mounted on the forward end of the respective current carrying rod with the electrode surfaces of the respective electrode units arranged opposite to each other and each having a main electrode carrying the electric current, at least one of said electrode units being movable into or out of engagement with the other electrode unit so that the main electric current is conductive or interrupted by a suitable driving means; and an exciting coil mounted to at least one of said electrode units, consisting of a plurality of unit exciting coils arranged adjacent to each other in a plane substantially parallel to the surface of the main electrode, and having one end connected to the current carrying rod and the other end connected in parallel to the main electrode, said unit exciting



coils including a plurality of first arms connected to the conducting rod and extending at an angle in a plane parallel to the main electrode and radially of the current carrying rod, a plurality of second arms connected to the main electrode, arranged close to the respective first arms and extending in a parallel, underlapped relation to the respective first arms with a space therebetween and a plurality of arcuate sections arcuately and integrally extending from the forward ends of the first arms to the forward ends of the second arms, disposed close to the next first arm, whereby magnetomotive forces generated by branched electric current flowing through the first and second arms are substantially cancelled with respect to each other and magnetic fields are created in a plane perpendicular to the surface of the main electrode by the branched electric currents flowed through the arcuate sections.

3,935,407

MULTIPHASE VACUUM SWITCH ASSEMBLY HAVING CAM OPERATED SPRING CHARGING DRIVE MECHANISM WITH LOST MOTION CONNECTION

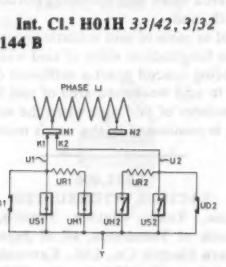
Alexander Bleibtreu, and Rolf Lauterwald, both of Regensburg, Germany, assignors to Maschinenfabrik Reinhausen Gebruder Scheubeck K.G., Regensburg, Germany

Filed Sept. 16, 1974, Ser. No. 506,063

Claims priority, application Germany, Sept. 25, 1973, 2348091

Int. Cl.[2] H01H *33/42*, *3/32*

U.S. Cl. 200—144 B **6 Claims**



1. A three phase transfer switch for tapped regulating transformers including

a. 12 vacuum switches forming two groups each of six situated at two different levels, the constituent vacuum switches of each said groups being arranged in circular coaxial patterns and the vacuum switches on one of said levels being arranged in registry with the vacuum switches on the other of said levels;

b. pairs of aligned operating rods movable in a direction longitudinally thereof arranged between registering pairs of vacuum switches at different levels for operating said pairs of vacuum switches at different levels;

c. a drive mechanism having a common power driven driving element for said pairs of operating rods movable in the direction of the axis of said circular coaxial patterns, said drive mechanism including a drive shaft arranged along an axis defined by the centers of said two groups of vacuum switches;

d. lost motion connection means interposed between said driving element and said pairs of aligned operating rods to impart a predetermined sequence to the operation of said vacuum switches;

e. a plurality of helical compression springs extending parallel to said drive shaft and arranged generally in a cylindrical surface surrounding said drive shaft;

f. cam means and abutment means both jointly pivotable with said drive shaft for loading said plurality of helical compression springs in response to predetermined angular motions of said drive shaft and allowing said plurality of helical compression springs to expand upon angular motions of said drive shaft in excess of said predetermined angular motions thereof; and

g. an annular driving element surrounding said drive shaft operated by said plurality of helical compression springs and operating said lost motion connection means.

3,935,408

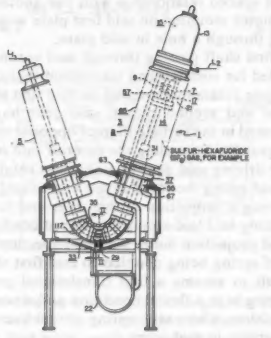
HEATING MEANS FOR HIGH-VOLTAGE GAS-TYPE CIRCUIT INTERRUPTER

Maurice J. Taylor, Dedham, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 21, 1973, Ser. No. 427,278

Int. Cl.[2] H01H *33/57*

U.S. Cl. 200—148 B **23 Claims**



1. A high-voltage circuit-interrupter of the gas-blast type including separable contact means separable to establish an arc, blast-valve means for causing a blast of gas to flow against the arc to effect the extinction thereof, operating means to effect the separation of said separable contact means, an elongated high-voltage conductor leading to one of the separable contacts, an annular grounded metallic collector chamber (37) of relatively short length surrounding said high-voltage conductor yet spaced outwardly therefrom, conduit means providing gas-communication between said annular grounded relatively-short metallic collector chamber (37) and the gaseous region adjacent said separable contact structure, heating means associated with said grounded metallic collector chamber of relatively short length to heat the gas therein,

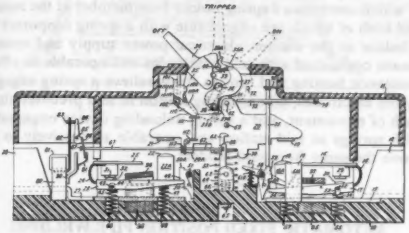
and means for feeding high-pressure gas directly into said metallic collector chamber.

3,935,409

CURRENT-LIMITING CIRCUIT BREAKER

Leonide P. Koval, Far Rockaway, N.Y., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 195,739, May 18, 1962, Pat. No. 3,813,619. This application Nov. 12, 1973, Ser. No. 414,648
Int. Cl. H01h *3/00*
U.S. Cl. 200—153 G 5 Claims



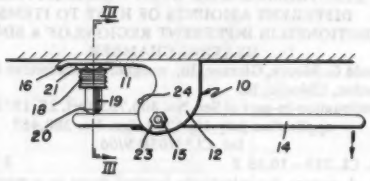
1. An electric circuit breaker comprising:
a an insulating enclosure,
b a movable contact member movable between open and closed circuit positions,
c an operating member movable between open and closed circuit positions corresponding to said open and closed circuit positions of said movable contact member,
d said operating member comprising a first portion movably supported in said enclosure,
e a cam member pivotally supported on said first portion of said operating member,
f latch means movably mounted on said operating member and disposed to engage said cam member during at least a portion of the movement of said operating member from said open to said closed circuit position,
g said latch means when in engagement with said cam member serving to retain said cam member in a position in which said cam member is operable upon said movable contact member, and
h means operable upon movement of said operating member a predetermined amount to release said latch means from said cam member.

3,935,410

SWITCH ACTUATOR WITH ELONGATED LEVER

Albert L. Howard, 27 Pleasant St., Northboro, Mass. 01532

Filed Sept. 3, 1974, Ser. No. 502,544
Int. Cl.² H01H *3/04*
U.S. Cl. 200—332 7 Claims



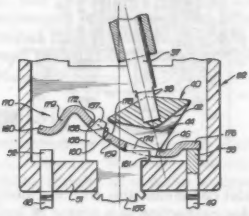
1. Switch actuator, comprising:
a. base adapted to lie against a surface from which a switch protrudes, the base being bifurcated to provide two spaced, parallel legs which lie on either side of the switch and are clamped in place by a portion of the switch,
b. a pair of ears extending from the base, and
c. a lever pivotally mounted on a pivot pin extending between the ears, the lever contacting the switch at a position substantially spaced from the pivot pin.

3,935,411

TOGGLE SWITCH

Anthony R. Ford, West Covina, Calif., assignor to Airpax Electronics Incorporated, South El Monte, Calif.

Filed Dec. 27, 1973, Ser. No. 428,706
Int. Cl.² H01H *21/04*
U.S. Cl. 200—67 G 2 Claims



1. A toggle switch comprising:
a housing body having a cavity formed therein;
a central common input terminal post projecting into the cavity and terminating upwardly in fulcrum support means;
a generally rectangular conductive blade supported on the fulcrum support means for pivotal movement about an axis extending in a lateral direction substantially normal to the long axis of said rectangular blade;
a pair of output terminal posts projecting into the cavity and terminating in a pair of upwardly directed contact surfaces, each contactable by an opposite blade end portion;
an actuator assembly pivotally mounted on the body, including a downwardly biased actuator tip in the cavity provided with a pair of laterally spaced actuator legs slidable longitudinally along the upper surface of the blade along spaced paths extending parallel to the axis of said rectangular blade and along respective lateral opposite sides of the fulcrum support means;
said fulcrum support means including an upwardly extending projection, said blade having formed therein an opening for receiving the projection through the opening, said actuator legs contacting the blade along the respective laterally opposite sides of said projection when said actuator assembly is pivoted past said projection, said opening being offset from the longitudinal center of the blade, the pivotal axis of said blade lying below said blade and below the upper end of said projection.

3,935,412

INDUCTION HEATED VAPOR SOURCE

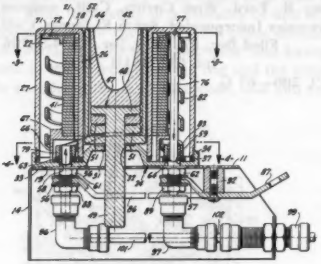
George W. McDonough, Cupertino; Douglas S. Schatz, Santa Clara, and Emmett R. Anderson, Los Gatos, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed May 22, 1974, Ser. No. 472,179
Int. Cl.² H05B *5/18*
U.S. Cl. 219—10.49 8 Claims

1. In an induction heated source for vaporizing a material:
A. a base;
B. a helically wound work coil surmounted on the base and comprising a plurality of closely spaced windings of a generally flat, solid electrical conductor oriented with its flat surfaces facing axially of the coil;

C. a housing having radially spaced apart inner and outer side walls disposed coaxially of the coil, said housing and coil forming an inner chamber between the inner periphery of the coil and the inner wall of the housing and an outer chamber between the outer periphery and the outer wall of the housing;

D. means for supporting the material to be vaporized in a predetermined position in the region defined by the inner wall of the housing;



E. a flow inlet communicating with the inner chamber and adapted for connection to a source of liquid coolant;

F. means forming a spirally extending flow passageway between the inner and outer chambers at one end of the coil for carrying the coolant from the inner chamber to the outer chamber and imparting a swirling movement to the coolant; and

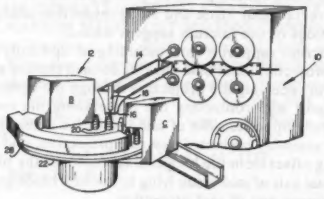
G. a flow outlet communicating with the outer chamber for passing the coolant from the chamber.

3,935,413

APPARATUS FOR STRESS RELIEVING SPRINGS AND THE LIKE

Richard Lesko, Harwinton, and David Reynolds, Torrington, both of Conn., assignors to Torin Corporation, Torrington, Conn.

Filed May 30, 1974, Ser. No. 474,370
Int. Cl.² H05B *3/00*
U.S. Cl. 219—50 **13 Claims**



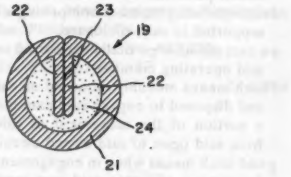
1. Apparatus for stress relieving springs and the like comprising a loading station, a device for delivering springs in succession to said loading station, a series of similar spring holders movable in a predetermined horizontal path which includes said loading station, each of said spring holders taking the form of an upright pin on and about which a coil spring may be deposited by said delivery means, and each of said holders also comprising an electrically conductive base member upon which a lower end portion of a coil spring rests when the spring is deposited on the pin, each said base member having an inclined seating surface and an associated short vertical abutment surface adjacent the lower end of the associated upright pin, said inclined surface being engageable with a side surface of a lower-most end coil of a spring supported on the pin, and said abutment surface being engageable with an end surface of such a coil, means for intermittently moving said holders along said path so that springs are successively deposited on said upright pins of said holders at said loading station, a stress relieving station in said predetermined path of movement, a spring indexiing device adjacent said predetermined path of movement between said loading and stress relieving stations, said device comprising an element engageable with and operable frictionally to rotate springs on said upright pins as they pass said device, the direction of rotation being such as to seat each spring with the side surface of the lower-most end coil in engagement with said inclined seating surface on said base member and with the end surface of said coil in engagement with the vertical abutment surface on said member, a pair of electrodes at said stress relieving station one of which comprises a spring holder base member at the station and both of which are engageable with a spring supported by a holder at the station, electrical power supply and control means connected with said electrodes and operable to effect resistance heating and thus to stress relieve a spring engaged by the electrodes, an unloading station in said predetermined path of movement, and a spring unloading device engageable with springs at said station and operable successively to remove the same from said holders.

3,935,414

AUTOMATIC FIXED POSITION PIPE WELDING

John T. Ballass, Norwich, and Richard A. Georgetti, Mystic, both of Conn., assignors to Unicore, Inc., North Haven, Conn.

Filed Oct. 11, 1974, Ser. No. 514,196
Int. Cl.² B23K *31/06, 35/22*
U.S. Cl. 219—61 **6 Claims**



1. A flux-cored electrode wire for use in gas-shielded electric arc welding of fixed position pipes comprising a drawn steel sheath having a core and a welding mixture contained within the core and constituting 14 percent –17 percent by weight of the wire, said welding mixture consisting essentially of, by weight of said mixture, 16–17 percent ferro manganese, 10–11 percent ferro silicon, 1–4 percent manganous oxide, ½-1 percent of potassium aluminum fluoride, and the balance rutile, the sheath exterior surface being shiny and metallic-appearing with unremoved drawing compound residues.

3,935,415

ELECTROMAGNETIC OVEN WHICH SUPPLIES DIFFERENT AMOUNTS OF HEAT TO ITEMS POSITIONED IN DIFFERENT REGIONS OF A SINGLE HEATING CHAMBER

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 300,763, Oct. 25, 1972. This application July 18, 1973, Ser. No. 380,487
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 F **2 Claims**

1. A system for selectively heating items in a microwave oven comprising:

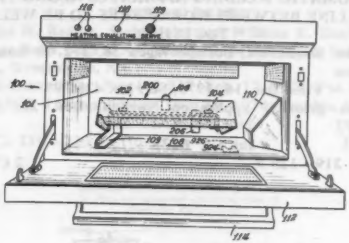
a chamber having conductive walls and a conductive floor;

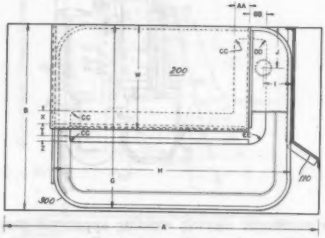
means for supplying microwave energy to the interior of said chamber;

a tray positioned within said chamber;

a shield located over a portion of said tray and cooperating with said conductive floor to shield a portion of said tray from microwave energy,

said shield defining an unshielded L-shaped area on said tray; and





an energy-focusing inwardly directed wall of said chamber which cooperates with said shield to define a channel having conductive walls, said channel being adjacent one branch of said unshielded L-shaped area on said tray, thereby to concentrate microwave energy in said one branch of said L-shaped area.

3,935,416

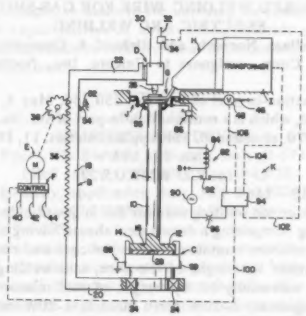
INDUCTOR-WORKPIECE POSITION DETECTOR

John F. Cachat, Cleveland, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed June 24, 1974, Ser. No. 482,271

Int. Cl.² H05B 5/02

U.S. Cl. 219—10.77 **16 Claims**



1. An induction heating device comprising support means for an elongated metal workpiece including a stem having an axis and a radial flange at one end of the stem, an inductor coil for axially heating a workpiece supported by said support means, said coil being coaxial with said stem, electrical drive means for relatively displacing said workpiece support means and induction coil along a linear path parallel to said axis and in the direction to move said coil and flange toward one another, and electrical circuit means including energizable means for delivering a control signal to said drive means upon movement of said workpiece flange and inductor coil to a predetermined axially spaced position in said direction, said circuit means including an electrical contact ring positioned axially between said inductor coil and workpiece support means, said contact ring being supported relative to said inductor coil and in surrounding coaxial and radially spaced relationship with the stem of a workpiece on said support means, a power supply, and means connecting said contact ring and said workpiece support means in series across said power supply, said contact ring engaging said workpiece flange upon movement of said flange and inductor coil into said predetermined position, thus to close said circuit means and energize said means for delivering a control signal.

3,935,417

WELDING OF COPPER AND IRON

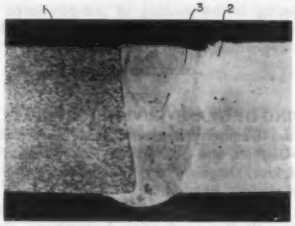
Tomio Umino, Hitachi; Munenobu Suzuki, Mito, and Tomohiko Shida, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 15, 1973, Ser. No. 388,500

Claims priority, application Japan, Aug. 30, 1972, 47-86231

Int. Cl.² B23K 15/00

U.S. Cl. 219—121 EM **11 Claims**



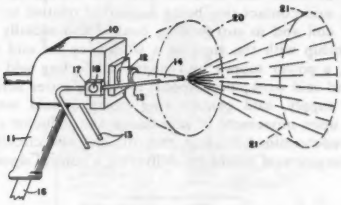
1. A method for welding copper or a copper base alloy and iron or an iron base alloy wherein the welding is performed without the use of a flux and a molten metal can be observed directly, characterized in that a copper joint material containing at least 90 percent of copper and an iron joint material containing at least 50 percent of iron are welded together by melting closely adjacent portions of the copper joint material and the iron joint material into a weld metal and by incorporating into said weld metal a first element for pulverizing the crystal grains of the weld metal, said first element being at least one member selected from the group consisting of titanium, aluminum, zirconium, niobium, and tantalum, and a second element for enhancing the mutual miscibility of copper and iron in the weld metal, said second element being at least one member selected from the group consisting of nickel, silver, paladium and platinum, wherein said first element is added in an amount of from 0.8 to 8 percent by weight and said second element is added in an amount of from 0.2 to 17 percent by weight, based on the weight of the weld metal.

3,935,418

PLASMA GUN INCLUDING EXTERNAL ADJUSTABLE POWDER FEED CONDUIT AND INFRARED RADIATION REFLECTOR

Mille Stand, New York, and Stephen U. Davis, New Rochelle, both of N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,482
Int. Cl.² B23K 5/00
U.S. Cl. 219—121 P 11 Claims



1. In a plasma gun having a flame ejected from a nozzle for depositing powdered material onto a substrate located at a distance spaced from the end of said flame, said flame comprised of three thermal components, namely, conductive, convective and radiative, with said conductive and convective components being carried forward with the streaming plasma gas, the improvement comprising:

at least one adjustable powder conveying conduit for applying powdered fluent material to the plasma flame, said conduit secured to said gun; and

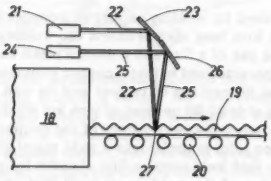
a reflector mounted on said gun for utilizing the radiative thermal component, said reflector having a concave reflecting area, said plasma flame disposed at the focal point of the reflector so that the reflector focusses the radiative thermal component toward the substrate for assisting in the melting of the powdered material and increasing the temperature of said substrate to facilitate the deposition of the powdered material.

3,935,419

SEVERING OF GLASS OR VITROCRYSTALLINE BODIES

Emmanuel Lambert, Brussels; Jean-Louis Lambert, Chaumont-Gistoux, and Bernard De Longueville, Sterrebeek, all of Belgium, assignors to Glaverbel-Mecaniver S.A., Watermael-Boitsfort, Belgium

Filed Oct. 11, 1973, Ser. No. 405,597
Claims priority, application Luxemburg, Oct. 12, 1972, 66279
Int. Cl.² C03B 33/00
U.S. Cl. 219—121 LM 9 Claims



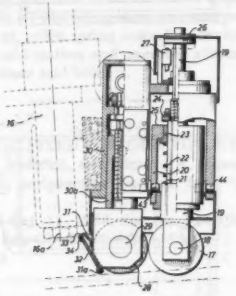
1. In a method for severing a body of soda-lime glass having a thickness of at least 5 mm by irradiating the body with at least one laser beam producing energy which is absorbed by the body to induce breaking stresses therein, the improvement comprising irradiating the body with at least two laser beams of respectively different wavelengths with respect to which the body has respectively different degrees of transparency and giving at least one of the laser beams at least a predominant wavelength such that at least 10 percent of the energy of such laser beam penetrates the body to a depth of at least 0.2 mm.

3,935,420

MEANS FOR GUIDING THE WELDING UNIT OF AN AUTOMATIC WELDING APPARATUS ALONG THE JOINT LINE BETWEEN WORKPIECES TO BE WELDED TOGETHER

Stig Rune Sandstrom, Borlebrovagen 28, 372 00 Ronneby, Sweden

Filed Dec. 18, 1973, Ser. No. 425,797
Claims priority, application Sweden, Dec. 29, 1972, 17202/72
Int. Cl.² B23K 9/12
U.S. Cl. 219—125 R 2 Claims



2. An automatic electric welding apparatus comprising a joint line follower for guiding a laterally and vertically movable welding unit along the joint line between workpieces during welding, a support member positioned behind the joint line follower and resting upon at least one of said workpieces during welding, the welding unit being movable vertically solely in dependence upon the vertical position of the support member, and a plate-like protecting means positioned between the support member and the electrode of the welding unit for preventing weld splash from fastening to the support member during welding and protecting the support member from heat radiation from the weld joint, said protecting means extending into the space between the support member and the workpieces and comprising a replaceable asbestos plate inserted between two curved edges of a holder projecting downwardly from the welding unit.

3,935,421

FLUX-CORED WELDING WIRE FOR GAS-SHIELDED ELECTRIC ARC WELDING

John T. Ballass, Norwich, and Richard A. Georgetti, Mystic, both of Conn., assignors to Unicore, Inc., North Haven, Conn.

Continuation-in-part of Ser. No. 250,240, May 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 53,016, July 7, 1970, abandoned. This application Oct. 11, 1974, Ser. No. 514,195
Int. Cl.³ B23K 35/22
U.S. Cl. 219—146 11 Claims

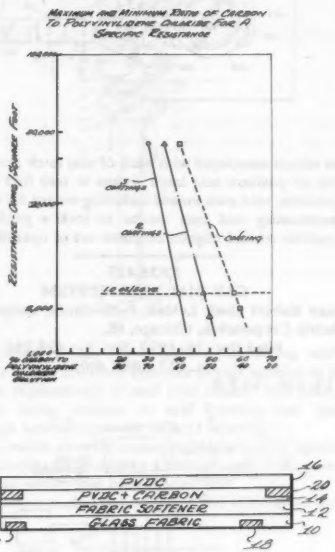
1. A flux-cored welding wire for use in gas-shielded electric arc welding comprising a drawn steel sheath having a core and a welding mixture contained within the core and constituting 12–20 percent by weight of the wire, said welding mixture consisting essentially of, by weight of said mixture, 6–20% ferro manganese, 6–20% ferro silicon, 1–20% manganous oxide, ½–5% of a fluoride compound selected from the group consisting of sodium fluoride, sodium silica fluoride, calcium fluoride, lithium fluoride, potassium aluminum fluoride and potassium titanium fluoride, and the balance rutile and consti-

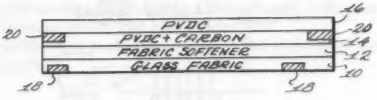
tuting at least 50 percent of the mixture, the sheath exterior surface being shiny and metallic-appearing with unremoved drawing compound residues.

3,935,422
ELECTRICALLY HEATED LAMINATE WITH A GLASS HEATING FABRIC

Richard D. Barnes, Stokesdale, and William E. Sharpe, Jr., Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 441,817, Feb. 12, 1974, Pat. No. 3,876,968. This application Dec. 16, 1974, Ser. No. 533,176
Int. Cl.² H05B *3/34*
U.S. Cl. 219—213 **3 Claims**


MAXIMUM AND MINIMUM WIDTH OF CARBON TO POLYVINYLIDENE CHLORIDE FOR A SPECIFIC RESISTANCE
RESISTANCE - OHMS / SQUARE FOOT
1 COATINGS
2 COATINGS
1 COATING
LOWEST RESISTANCE
LOCUS OF MAXIMUM TO POLYVINYLIDENE CHLORIDE RATIO
MINIMUM TO POLYVINYLIDENE CHLORIDE RATIO



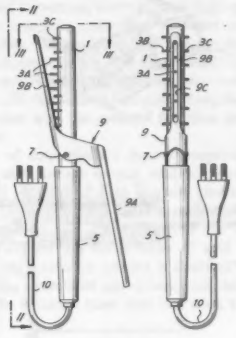
2. A plaster board comprising a flexible heater fabric incorporated into a plaster binder, said heater fabric comprising a woven glass cloth having a layer of an electrically conductive mixture to provide a desired watt density comprising carbon and a vinylidene chloride polymer, electrical means in contact with the conductive mixture for applying an electrical potential and a vapor barrier of a vinylidene chloride polymer to protect the conductive mixture from moisture and accidental electrical contact.

3,935,423
HAIRDRESSING DEVICE

Massimo Pucci, Via Borsi 41, Livorno, Italy (I-57100)

Filed July 1, 1974, Ser. No. 484,878
Claims priority, application Italy, July 3, 1973, 17405/73
Int. Cl.² H05B *1/00*; A45D *1/04*
U.S. Cl. 219—225 **3 Claims**

1. A hairdressing device comprising, in combination, an elongated circular cross-section cylindrical body having a relatively small diameter adapted to the size of a hair curl; heating means in said body operable to heat said body uniformly throughout its length; a gripping handle secured to one end of said body; a first longitudinally extending rectilinear row of comb teeth projecting radially from said body; second and third longitudinally extending rectilinear rows of comb teeth projecting radially from said body on opposite sides of said first row and spaced symmetrically relative to said first row to define therewith a hair brush; said comb teeth being in heat exchange relationship with said body so as to be heatable by said heating means; and a relatively thin pliers member articulated to said body, and having an operating portion adjacent said handle and an elongated active portion extending in alignment with said first row of comb teeth and movable toward engagement with said body to press the hair against

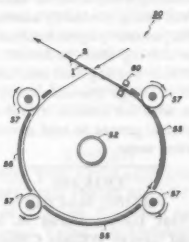


said body for curling of the hair between said active portion and said body; said active portion having a width less than the spacing of the second and third teeth rows from each other so as to be movable into the space between said second and third teeth rows and having an elongated slot therein through which the comb teeth of said first row extend when said active portion is substantially engaged with said body, said three rectilinear rows of comb teeth providing for said device to be used to brush the hair with heated comb teeth.

3,935,424
FLASH FUSING APPARATUS

Thomas L. Donnelly, and Edward J. Mullen, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 18, 1974, Ser. No. 516,042
Int. Cl.² H05B *1/00*; G03G *15/00*
U.S. Cl. 219—216 **4 Claims**



1. An improved flash fusing apparatus for fusing toner images onto a copy sheet comprising:

an elongated flash lamp,

a cylindrically shaped member circling said flash lamp along the longitudinal axis thereof, and

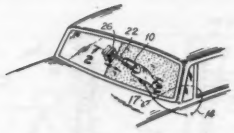
means for positioning a copy sheet bearing toner images along the cylindrical member to form a circular path around said flash lamp whereupon energizing said lamp uniform direct radiation is imparted to the sheet to fuse the toner particles at a reduced power output.

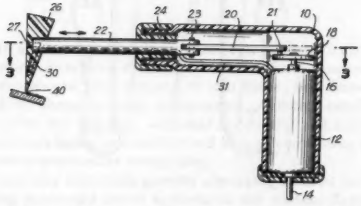
3,935,425

MECHANIZED ELECTRICALLY HEATED WINDSHIELD CLEANER

David Weissberger, 25 Lawrence Park Crescent, Bronxville, N.Y. 10708, and Isidore Kalichmann, 9231 57th Ave., Rego Park, N.Y. 11373

Filed Nov. 7, 1973, Ser. No. 413,522
Int. Cl.² H05B 1/00; A47L 1/06 B26B 7/00
U.S. Cl. 219—228 1 Claim





1. A hand-held mechanical device adapted for removing snow, ice, mud and other caked detritus from a motor vehicle windshield; the device comprising a housing of generally one-piece construction having a hollow pistol-like handle portion for gripping and another hollow portion connected thereto and extending therefrom generally at a right angle to said hollow handle portion; bearing means removably secured to the forward end of said other hollow portion of said housing and having a sleeve element forming a central bearing bore; a driving shaft extending from the forward end of said other hollow portion and being slidable supported by said central bearing bore of said sleeve element; a blade secured to said driving shaft and being formed of a resilient rubber-like material; electric motor means within said handle portion of said housing, a rotatable shaft extending from the motor means, a disc mounted for rotation by the rotatable shaft, a connecting rod means connecting the disc to the driving shaft, one end of the rod being pivotably connected to said driving shaft, the other end of the rod being pivotably connected eccentrically to the rotatable disc, whereby upon rotation of the disc by said motor means, the driving shaft is driven in a reciprocating manner; an electrical heating coil embedded in the blade generally adjacent the edge thereof and in parallel electrical circuit connection with the electric motor means, and means for supplying electrical power to said motor means and heating coil for operating same.

3,935,426

VOTING MACHINE

Cothburn M. O'Neal, Dallas; Alfred M. Mayo, Richardson, both of Tex., and George William Childs, deceased, late of Dallas, Tex. (by Patricia M. Childs, executrix), assignors to The Riverside Press, Inc., Dallas, Tex.

Division of Ser. No. 309,174, Nov. 24, 1972, Pat. No. 3,866,826. This application May 28, 1974, Ser. No. 473,923
Int. Cl.² G07C 13/00
U.S. Cl. 235—54 C 6 Claims

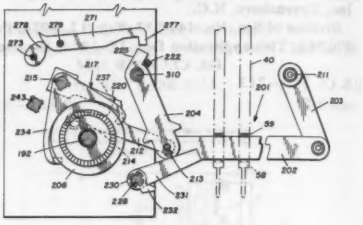
1. A voting machine comprising:

a plurality of aligned columns of voting keys, said keys being moveable from a non-voted to a voted position;

abutment means carried on said keys;

linkage means at each column of keys including a pivotally mounted bar extending along said column of keys, said linkage means having a first position corresponding to the position assumed by the keys in a non-voted position and moveable by actuation of said keys to a voted position;

selective column lockout means associated with said columns, said column lockout means including latch means at each column of keys having a first position engageable with said linkage means to prevent displacement of said linkage means and a second non-latching position; and



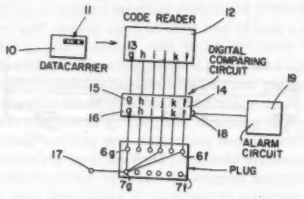
cam means associated with each of said latch means operable to position said latch means in said first or second position, said cam means including means for selectively positioning said cam means to lock a predetermined number of said aligned columns out of operation

3,935,427

CAR DIAGNOSIS SYSTEM

Herman Robert Geul, Leiden, Netherlands, assignor to Sun Electric Corporation, Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,214
Int. Cl.² G06K 9/08
U.S. Cl. 235—61.7 R 5 Claims



1. A system for checking correspondence between datacarrier, to be used in an automatic automative diagnosis apparatus, and the car to be tested, characterized in that the car is provided with a code-key in which the car characterizing code is recorded, said code corresponding with a code recorded on the datacarrier, means to read-out the code on the code-key and the code on the datacarrier, means to compare the code read-out from the datacarrier, and means to provide a signal in the event of absence of agreement between the code on the code-key and the code on the data carrier to indicate that the test program for the car should be stopped.

3,935,428

REPLACEABLE PASSENGER TABULATING AND RECORDING CARD READER UNIT

Earl R. Itrich, Tucson, Ariz., assignor to Earl R. Itrich, Tucson, Ariz.

Filed Sept. 4, 1974, Ser. No. 502,927
Int. Cl.² F16M 13/02; G06K 7/08; G07F 9/06
U.S. Cl. 235—61.11 R 6 Claims

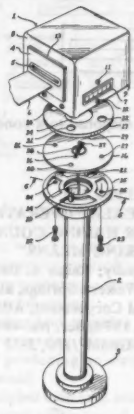
1. An easily replaceable electrically powered pass card operated card reader unit having replaceable components, said card reader unit being mountable within a public trans-

portation vehicle for tabulating and recording information presented by the pass cards, said card reader unit comprising:

a. a multi apertured housing;

b. support means for detachably mounting said housing, said support means including guide means for attachably positioning said housing onto said support means and attachment means for retaining said housing in place;

c. a card reader located within an aperture at the front of said housing;



d. disconnect means for detachably mounting said card reader within the front aperture of said housing to permit in situ replacement of said card reader, said disconnect means being internal to said housing and operable through another aperture of said housing;

e. a removable counter located within a further aperture in said housing for providing a visible count of the pass cards inserted within said card reader; and

f. verification means for verifying the viability of the pass cards.

3,935,429

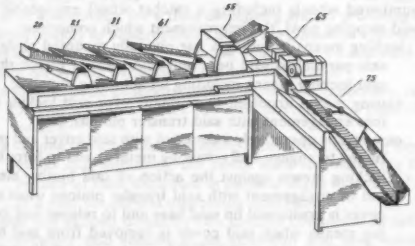
PROCESS AND APPARATUS FOR CONTROLLING DOCUMENT FEEDING MACHINES FROM INDICIA CONTAINED ON A DOCUMENT FED THEREFROM

George N. Branecky, Bethel, and Gary R. Sochrin, Shelton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 18, 1975, Ser. No. 550,871

Int. Cl.³ G06K 7/10; B07C 5/38; G08C 9/06

U.S. Cl. 235—61.11 E **10 Claims**



1. In an inserting machine having a high speed feeder with a demand roller for feeding therefrom documents having control function indicia thereon, the improvements comprising

a. edge detector means for detecting the edge of a document in the demand roller of said feeder,

b. encoder reader means operatively coupled to said demand roller for generating timing signals in accordance with the surface speed of said demand roller,

c. storage means receiving said timing signals from said encoder reader means which is operatively coupled thereto, said storage means storing and converting said signals into distance signals in accordance with the movement of said document through said high speed feeder,

d. means for coupling said edge detector means to said storage means for enabling said storage means when a document is detected by said edge detecting means,

e. scanner reader means for scanning the control function indicia on said documents and generating data bit outputs in accordance with the control function indicia on said documents,

f. a plurality of data window means coupled to and controlled by said storage means, said scanner reader coupled to said plurality of data window means, and

g. means for coupling a first data bit output of said scanner reader means to said storage means for resetting said storage means on the occurrence of said first data bit after said edge detector means is enabled, whereby the programming control of any subsequent data windows is based on the distance from said first data bit.

3,935,430

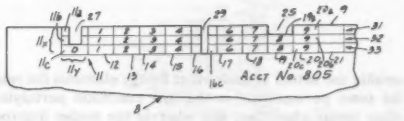
NOTCH AND FILE SYSTEM

Thomas P. Anderson, Hubbard Woods, Ill., assignor to Microseal Corporation, Evanston, Ill.

Filed May 3, 1971, Ser. No. 139,591

Int. Cl.³ G06K 21/00

U.S. Cl. 235—61.12 R **1 Claim**



1. A notch and file card comprising superimposable notches along a portion of an edge thereof, said notches being of different configurations so that when said notches are superimposed upon each other they may be visibly distinguished from each other, said notches including first, second and third notches, each of said notches having a depth and a width, said first notch being wider than said second or third notches and said second notch being wider than said third, said third notch being deeper than said first or second notch and said second notch being deeper than said first notch.

3,935,431

APPARATUS FOR THE STORAGE AND READING OF DATA COMBINED FROM BINARY NUMBERS

Kurt Scheffel, Weil am Rhein, Germany, assignor to The Grey Lab. Establishment, Vaduz, Liechtenstein

Filed Dec. 16, 1974, Ser. No. 533,128

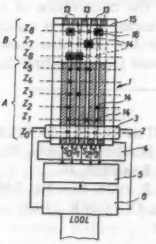
Claims priority, application Switzerland, Dec. 28, 1973, 18218/73

Int. Cl.³ G06K 7/06, 19/06

U.S. Cl. 235—61.11 A **29 Claims**

1. An apparatus for the storage and reading of data combined from binary characters, comprising a data carrier serving as a storage, said data carrier having columns and lines, means provided at intersection points of the columns and lines for portraying the binary characters in the form of binary signals, a reader for the data carrier which serves to generate binary signals portraying the stored data by means of a line-

by-line scanning of the data carrier and evaluation of the binary signals, the improvement comprising: said data carrier having adjacently arranged separate signal conductor tracks incorporating intermediate spaces extending along the columns and separating the conductor tracks, bridge elements provided for the data carrier for the one binary character in the intermediate spaces between the conductor tracks at predetermined intersection points of the columns and lines, said bridge elements interconnecting at the predetermined intersection points both of the conductor tracks of a relevant column with one another, said bridge elements being reversibly activatable from a first condition which can be detected via the conductor tracks of the columns through an external action into a second condition portraying a binary character and detectable via the conductor tracks, and for the other binary character the conductor tracks at other intersection points of the columns and lines are selectively either not interconnected with one another or interconnected by such bridge elements, and means for rendering ineffectual from the



outside the action at such other bridge elements for retaining the same permanently in the first condition portraying this other binary character, and wherein the reader incorporates means for generating the action in a region corresponding to a line of the data carrier, a feed mechanism for moving relative to one another the data carrier and the means generating the action in order to bring about a line-by-line scanning of the data carrier, an evaluation device, a detector operatively connected with the evaluation device for producing output signals for the evaluation device for determining the state of the bridge elements of the data carrier via its conductor tracks, said detector including a control device for the columnwise connection of pairs of conductor tracks determining the individual columns, said detector being designed such that its output signals in the case of bridge elements activated by the external action and connected therewith via a pair of conductor tracks possesses a first signal value portraying one binary character and otherwise a second signal value portraying the other binary character.

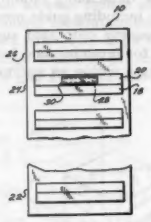
3,935,432

VARIABLE COLOR LABEL FOR OBJECT IDENTIFICATION SYSTEM

Robert L. Maynard, Huntington Bay, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,128
Int. Cl.² G06K *19/06, 7/12*
U.S. Cl. 235—61.12 N **18 Claims**

10. A label for use in a system for the identification of objects, said label being affixed to an object to be identified and comprising: an array of modules of colored elements arranged in a code to define data unique to the object and means on said label for altering the color of at least a portion



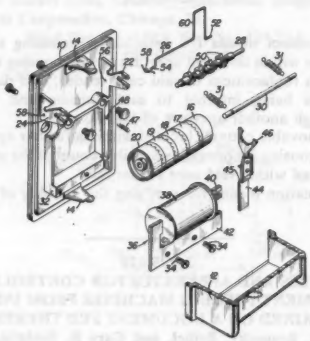
of one of said modules in response to a condition within said object.

3,935,433

ELECTROMAGNETICALLY OPERATED REMOTE METER OR REGISTER HAVING COUNTER WHEEL LOCKING MEANS

Edward F. Cielaszyk, Olgesby; Ralph A. DeRose, Villa Park, and John W. Kravcik, Western Springs, all of Ill., assignors to Neptune International Corporation, Atlanta, Ga.

Filed May 10, 1974, Ser. No. 468,730
Int. Cl.² G06M *1/10, 3/12*
U.S. Cl. 235—92 C **10 Claims**



1. In a remote register comprising a base and cover, relay means including an armature, a stepping pawl and a plurality of numbered wheels coaxially mounted on a shaft for sequential rotation, said wheels being operatively interconnected by transfer pinions rotatably mounted on a shaft, one of said numbered wheels including a ratchet wheel engageable by said stepping pawl, the improvement which comprises:

locking means including a bar pivotally mounted along an axis parallel to said base and said transfer pinion shaft, said locking means including an actuating member;

biasing means arranged to normally urge said locking bar into engagement with said transfer pinions; and

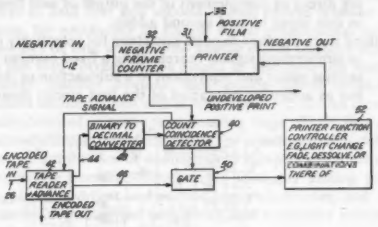
cam means operatively associated with said cover and positioned to engage said actuating member and to force said locking means against the action of said biasing means out of engagement with said transfer pinions when said cover is positioned on said base and to release said locking means when said cover is removed from said base whereby upon removal of said cover, said cam disengages said actuating member and said locking bar is urged into engagement with said transfer pinions to prevent said transfer pinions and numbered wheels from rotation.

V 9 4 2 / 4 J A 2 7 7 6 UMI

3,935,434
PRINTER CONTROL

Harry E. Rice, Van Nuys, and John K. Rude, Burbank, both of Calif., assignors to Technicolor, Inc., Hollywood, Calif.

Filed Mar. 4, 1963, Ser. No. 262,410
Int. Cl.² G06M *3/02*; G03B *33/10*
U.S. Cl. 235—92 CT 8 Claims



1. In a system for cuing and actuating a controller by means of information relating to a printer function and the negative frame number at which it is to occur encoded on a storage medium, said controller controlling the functioning of a motion picture printer printing a positive print from a negative, the combination comprising:

means for passing said negative through said printer;

a counter for counting the negative frames entering said printer and producing an output signal indicative of the number thereof;

first means coupled with said storage medium for producing an output signal indicative of the negative frame number information encoded thereon;

a coincidence detector coupled to said counter and said first means and responsive to the output signals therefrom to produce an output signal upon a coincidence thereof;

second means coupled with said storage medium for producing a control signal indicative of the printer function information encoded thereon; and

a gate having first and second inputs and an output, said first input being coupled with the output of said coincidence detector, said second input being coupled with the output of said control signal producing means, said output being connected to said controller, said gate being operative to pass said control signal to said controller upon the occurrence of a signal at said first input.

3,935,435
GASOLINE DISPENSER

Robert C. Greenwood, Cypress, Calif., assignor to Pan-Nova, Inc., Santa Fe Springs, Calif.

Division of Ser. No. 427,579, Dec. 26, 1973, Pat. No. 3,871,503. This application Oct. 21, 1974, Ser. No. 516,289
Int. Cl.² G07F *13/02*
U.S. Cl. 235—151.34 4 Claims

1. In a calculator for a fluid dispensing system providing an output display in hundredths of a unit for customer indication and an additional output display in quarters of a hundredth of a unit for system calibration, the combination of

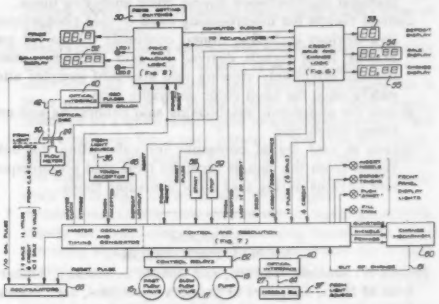
a volume pulse generator producing volume pulses at a rate of four hundred pulses per unit of volume of fluid dispensed;

a volume accumulator including means for counting input pulses and displaying the count state for indicating the volume of fluid dispensed in decimal digits in hundredths of a unit for normal dispensing operation;

first and second divide-by-two circuits connected in series between said volume pulse generator and said volume accumulator and having a first output for two hundredths of a unit and a second output for one hundredths of a unit, with said second output connected to said volume accumulator as an input;

a first on-off indicator having said first output connected thereto; and

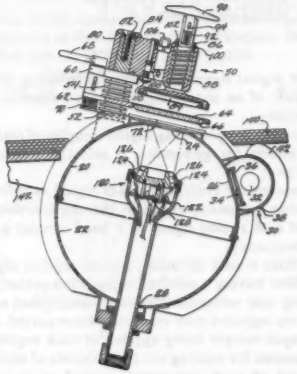
a second on-off indicator having said second output connected thereto, with said first and second indicators indicating the volume of fluid dispensed in quarters of a hundredth of a unit for calibration of the dispensing system.



3,935,436
COLOR MEASURING SPECTROPHOTOMETER

Jerry B. Holschlag, deceased, late of Greenwood, S.C. (by Jean D. Holschlag, executrix), and Lyle Wilcox, Clemson, S.C., assignors to Greenwood Mills, Greenwood, S.C.

Filed Apr. 24, 1973, Ser. No. 354,090
Int. Cl.² G06F *15/20*; G01J *3/00*
U.S. Cl. 235—151.35 64 Claims



43. A digital abridged spectrophotometer for determining color values of material of unknown color comprising:

detecting means including a detecting head having a viewing port for receiving said material to be color analyzed,

said detecting means including source means for providing light over the visible spectrum inside said head and substantially more than five photo-responsive devices each having light receiving means mounted inside said head for receiving incident reflected light from said port with said devices being responsive over all said spectrum respectively to a different color band for simultaneously providing exteriorly of said head a corresponding number of signals varying as a function of the respectively received incident light,

standardizing means including two differently colored standard samples,

means for alternately moving each of said samples between a sample off port position and a sample port covering position during calibrating times and for moving one of said samples to said port covering position with said material therebetween during color analyzing times,

control means for interrogating each of said photoresponsive devices including digital computer means for calibrating from signals derived by said photo-responsive devices effectively viewing said standard samples alternately once for each color analyzing time,

means for alternately establishing said calibrating and analyzing times, and

means in said digital computer for calculating the color values from the signals received from said photoresponsive devices during said color analyzing times.

3,935,437

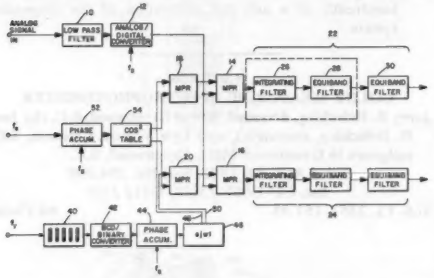
SIGNAL PROCESSOR

Joseph W. Schmitt, Hudson, and Donald L. Starkey, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 25, 1974, Ser. No. 445,745

Int. Cl.[2] G06F *7/38*; G01R *23/16*

U.S. Cl. 235—152 **16 Claims**



1. A digital signal processor for isolating different spectral segments of an analog signal applied thereto, said processor comprising

A. means for providing digital samples of said analog signal,

B. means for generating a selected reference frequency signal,

C. means for multiplying said digital samples by said reference frequency signal to thereby translate the spectrum of said analog signal to a band around a predetermined frequency,

D. filter means including a multi-register digital integrating filter having a selected integration period for accumulating said reference-frequency-multiplied samples in separate registers over said integration period, each multiplied input sample being applied to each register, and

E. means for reading out the contents of said registers at the end of each integration period at times separated by submultiples of the integration period.

3,935,438

DECIMAL ADDER

Ulrich Grupe, Stuhr, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH., Bremen, Germany

Filed Oct. 11, 1974, Ser. No. 513,956

Claims priority, application Germany, Oct. 20, 1973, 2352686

Int. Cl.[2] G06F *7/50*

U.S. Cl. 235—174 **23 Claims**

1. A decimal parallel adder comprising:

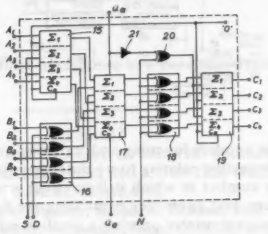
a plurality of arithmetic stages, one each for forming a new decimal digit, each such stage having a first binary adder for receiving signals representing a first and a second digit to be added;

circuit means in each said stage connected for feeding said signals to said adder and selectively and mutually exclusively providing the bit by bit complement of one digit and adding a particular number to one of the two digits;

a second adder in each said stage connected so that its output provides said new decimal digit;

second circuit means in each said stage for selectively passing direct or complement of the output of said first adder as one input to said second adder;

third circuit means in each said stage for selectively passing or suppressing signals representing a fixed number to said second adder and equivalent to a subtraction of the number as added by operation of the first circuit means;



circuit means for connecting the carry output of each first adder to the carry input of the first adder of the stage forming the next higer significant decimal digit; and

a controller common to all stages and connected to be responsive to the sign bits of numbers whose digits are fed to said stages and providing control signals for control of the selectivity of said first circuit means and further providing other control signals for control of the selectivity of said second circuit means, the controller additionally providing a sign bit for the number as assembled by operation of all said stages.

3,935,439

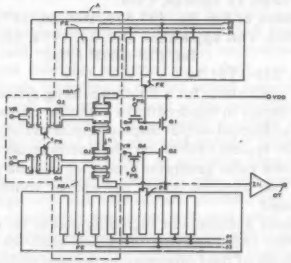
VARIABLE TAP WEIGHT CONVOLUTION FILTER

Dennis Darcy Buss, Cambridge, Mass., and Walter Howard Bailey, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 12, 1974, Ser. No. 487,105

Int. Cl.[2] G06G *7/19*; G11C *11/40*

U.S. Cl. 235—181 **24 Claims**



1. Analog signal processing apparatus comprising:

a first analog charge transfer device for receiving sampled values of a first analog signal and storing said sampled values at charge storage sites of said charge transfer device;

a second analog charge transfer device for receiving sampled values of a second analog signal and storing said

sampled values at charge storage sites of said charge transfer device;

each of said first and second analog charge transfer devices including a like plurality of stages each including a plurality of charge storage sites, at each said stage a plurality of electrodes for receiving multi-phase clock pulses to transfer said analog signal samples along said charge transfer device; analog signal multiplier means for corresponding pairs of said first and second analog charge transfer devices, for producing an output signal proportional to the product of first and second analog signal samples stored at the said corresponding stages of said first and second charge transfer devices, said analog signal multiplier means including first and second input electrodes electrically coupled to said corresponding stage of said first and second charge transfer devices for nondestructive detection of amplitudes of analog signal samples stored at said respective corresponding stages to apply analog pulse inputs to said first and second input electrodes; and

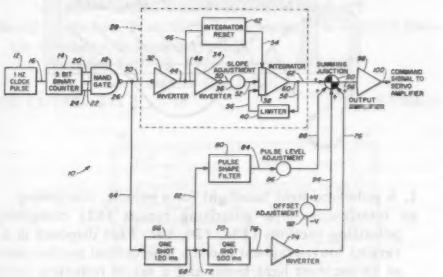
means for summing the outputs of said multiplier means.

3,935,440

CATAPULT BREAKAWAY LOAD SIMULATOR CIRCUIT

Robert D. Mood, Anaheim; Joseph P. Hunter, San Pedro, and Dering R. Burgen, Pico Rivera, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1975, Ser. No. 545,688
Int. Cl.² G06G 7/70
U.S. Cl. 235—184 **9 Claims**



1. A circuit for developing a required load vs. time signal to simulate the breakaway fitting load during a typical catapult launch comprising:

a. means for providing a clock pulse signal, said signal having a first amplitude,

b. means connected to said clock signal providing means for generating a first driver signal, said first driver signal being said first amplitude for a time period equal to seven cycles of said clock pulse signal followed by a second amplitude for a time period equal to one cycle of said clock pulse signal, said first amplitude being greater in value than that said second value, said first driver signal repeating once every eight cycles of said clock signal,

c. means connected to said first driver signal generating means for generating a first summing signal, said first summing signal being a ramp function starting at said second amplitude and terminating at a third amplitude with a time period equal to four cycles of said clock signal, followed by said third amplitude for a time period equal to three cycles of said clock signal, followed by said second amplitude for a time period equal to one cycle of said clock signal, said third amplitude being less than said first amplitude but greater than said second amplitude, said first summing signal repeating once every eight cycles of said clock signal,

d. means connected to said first driver signal generating means for generating a second driver signal, said second driver signal being said second amplitude for a time period of seven cycles of said clock signal followed by said first amplitude for a time period of less than one cycle of said clock signal, followed by said second amplitude for the remainder of the eights cycle of said clock signal a time period of less than one cycle of said clock signal, said second driver signal repeating once every eight cycles of said clock signal,

e. means connected to said second driver signal generating means for generating a second summing signal, said second summing signal being said second amplitude for a time period equal to seven cycles of said clock signal, followed by a spike pulse signal of amplitude equal to said first amplitude for a time period of less than one cycle, followed by said second amplitude for a time period of less than one cycle, said second summing signal repeating once every eight cycles of said clock signal,

f. means connected to said second driver signal generating means for generating a third summing signal, said third summing signal being said second amplitude for a time period equal to more than seven cycles of said clock signal but less than eight cycles of said clock signal followed by a fourth amplitude for a time period equal to less than one cycle of said clock signal, said fourth amplitude being less than said second amplitude, said third summing signal repeating once every eighth cycle of said clock signal, and

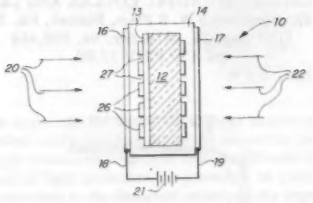
g. summing means connected to said first, second, and third summing signal generator means for summing said first, second, and third summing signals, said summing means having an output upon which appears said load vs. time signal, said load vs. time signal repeating once every eight cycles of said clock signal.

3,935,441

APPARATUS FOR MAINTAINING IMAGE DIGITIZATION IN PARALLEL OPTICAL DIGITAL PROCESSING SYSTEMS

Ralph E. Aldrich, Acton, and Julius Feinleib, Cambridge, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 2, 1974, Ser. No. 430,020
Int. Cl.² H01J 39/12
U.S. Cl. 250—211 R **9 Claims**



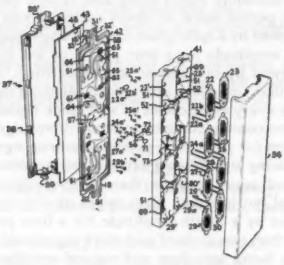
1. In an imaging apparatus including a photosensitive device responsive to applied radiation for establishing internal electric fields representative of the intensity of different portions of said applied radiation; the improvement comprising:

a two-dimensional array of radiation transmissive electrically conductive targets associated with said device, each of said targets in said array being electrically isolated from one another and being aligned to receive a different one of said portions of said applied radiation for establishing a plurality of discrete internal electric fields, each of which are representative of the intensity of one of said radiation portions, and each of which are substantially uniform over the area of the targets due to the high conductivity thereof notwithstanding any non-uniformities that might exist in the intensity distribution of any of said radiation portions.

3,935,442
PHOTOFLASH LAMP ARRAY HAVING ELECTRICALLY CONNECTED REFLECTOR

James M. Hanson, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,410
Int. Cl.² G03B 15/02
U.S. Cl. 240—1.3 7 Claims

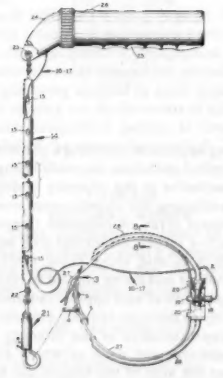


1. A multiple flash lamp array comprising a plurality of electrically fired flash lamps each having a pair of lead-in conductors, a circuit board containing thereon circuitry for sequentially firing said flash lamps, means electrically connecting said lead-in conductors of the flash lamps to said circuitry, and an electrically conductive reflector unit positioned between said lamps and said circuit board and shaped to reflect light from said lamps when flashed, said circuitry including a conductive area on said circuit board, said reflector unit including a web, a U-shaped conductive clip positioned between and in electrical contact with said conductive reflector unit and said conductive area on the circuit board and arranged so that the legs thereof are clipped against said web, said web and said conductive area being relatively aligned one behind the other and the base of said U-shaped clip extending against said conductive area on the circuit board.

3,935,443
ILLUMINATED ANIMAL COLLAR AND LEASH

Allen P. Simmons, 4661 W. 8 Place, Hialeah, Fla. 33012

Filed Aug. 26, 1974, Ser. No. 500,460
Int. Cl.² F21V 33/00
U.S. Cl. 240—6.4 W 8 Claims

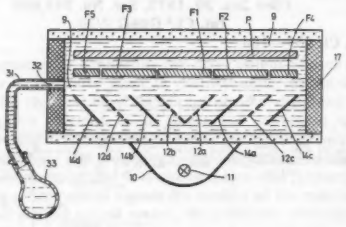


1. An illuminated animal collar and leash assembly comprising:
a flexible collar having electrically-energized light source means therein;
an elongated, flexible leash connected at one end to said collar and having electrically-energized light source means therein providing localized illumination spots along the length of the leash;
and battery means connected to said light source means in the leash and said light source means in the collar for energizing the same.

3,935,444
POLARIZED LIGHT BEAM SOURCE IN A VEHICLE HEADLIGHT

Richard Zechnall, Stuttgart; Ernst Linder, Muhlacker; Albert Schmid, Schwieberdingen; Gotthold Raabe, Stuttgart; Karl Kerner, Stuttgart, and Rudi Socknick, Kornwestheim, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 3, 1974, Ser. No. 502,761
Claims priority, application Germany, Sept. 10, 1973, 2345633
Int. Cl.² F21M 3/26
U.S. Cl. 240—9.5 6 Claims



1. A polarized light headlight for a vehicle, comprising:
an interference-type polarizing means (12) comprising polarizing sections (12*a*, 12*b*, 12*c*, 12*d*) disposed in diverging louvre fashion about a longitudinal median plane of an incident light beam and a set of reflecting layers (14*a*, 14*b*, 14*c*, 14*d*) alternating between adjacent and similarly directed polarizing sections,
said polarizing sections and said reflecting layers each being set at an angle of 45° to said median plane, said polarizing sections and said reflecting layers being so constituted that no part of the incident beam reaching said interference-type polarizer fails to impinge either on one of said polarizing sections or on one of said reflecting layers,
said polarizing sections and reflecting layers being of such contours that the projection of each of them perpendicularly on said median plane is substantially a rectangle and all said rectangles are substantially congruent.

3,935,445
SOCKET MOUNTING STRUCTURE FOR VEHICLE LIGHTS

James Michael Preisler, Minneapolis, Minn., assignor to Drag Specialties, Inc., Edina, Minn.

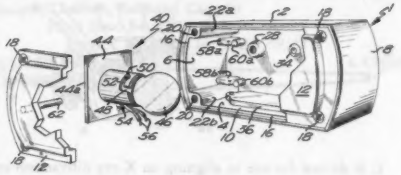
Filed Mar. 4, 1974, Ser. No. 447,944
Int. Cl.² B60Q 1/30
U.S. Cl. 240—7.1 R 10 Claims

1. A light for external mounting on vehicles comprising:
a housing having walls defining an enclosure, said enclosure having an access opening on one side thereof;
a translucent lens removably attached to said housing in covering relation to said access opening;
a light bulb socket completely contained and enclosed within said housing;

an opening in a wall of said housing for the passage of lead wires from said socket therethrough;

a base plate on which said socket is fixedly secured to provide a socket assembly;

locating and retention means within said housing for holding said socket assembly therein comprising at least one pair of closely spaced retention members secured to the inside of said housing, with said socket base plate held



between said retention members in a forced fit therewith; and

a hold-down element projecting from the inside face of said lens, said hold-down element being of a predetermined length such that it will firmly bear against said socket assembly, thereby securing said socket against displacement in a direction toward said lens side of said housing when said lens is attached thereto.

3,935,446

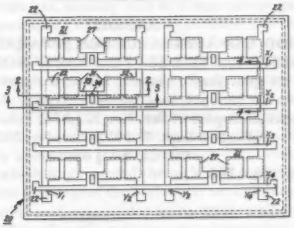
APPARATUS FOR SENSING RADIATION AND PROVIDING ELECTRICAL READOUT

Gerald J. Michon, Waterford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 28, 1975, Ser. No. 554,155

Int. Cl.² H01J 39/12

U.S. Cl. 250—211 J **9 Claims**



1. In combination,

a substrate of semiconductor material having a major surface,

a plurality of first conductive plates, each overlying and in insulated relationship to said major surface and forming a first conductor-insulator-semiconductor capacitor with said substrate,

a plurality of second conductive plates, each adjacent a respective first conductive plate to form a plurality of pairs of plates, said pairs of plates being arranged in a matrix of rows and columns, each of said second conductive plates overlying and in insulated relationship to said major surface and forming a second conductor-insulator-semiconductor capacitor with said substrate, each coupled to a respective first conductor-insulator-semiconductor capacitor,

a plurality of row conductor lines, the first conductive plates in each of said rows connected to a respective row conductor line,

a plurality of column conductor lines, the second conductive plates in each of said columns connected to a respective column conductor line,

a first voltage means for providing a first voltage between said row conductor lines and said substrate to deplete respective first portions of said substrate lying thereunder of majority charge carriers and provide a potential of a first value therein,

a second voltage means for providing a second voltage between said column conductor lines and said substrate to deplete respective second portions of said substrate lying thereunder of majority charge carriers and providing a potential of a second value therein, said second value being less than said first value,

means for exposing said substrate to radiation whereby charge is stored in said first portions of said substrate,

first means for collapsing and reestablishing said first voltage on each of said row conductor lines in sequence during a respective first period of time, whereby charge stored in each of said first portions of said substrate moves to a respective second portion thereof,

means for sensing in sequence the voltage on each of said column lines during said first period and deriving a video signal therefrom.

3,935,447

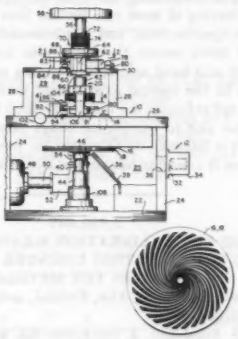
ANGULAR MOTION DETECTION APPARATUS

Dewie E. Black, Dearborn Heights; Donald F. Fabry, Garden City, and Thaddeus Dombrowski, Detroit, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 396,783, Sept. 13, 1973, which is a continuation of Ser. No. 196,844, Sept. 1, 1971, abandoned. This application Dec. 26, 1974, Ser. No. 536,391

Int. Cl.³ G01D 5/34

U.S. Cl. 250—233 **10 Claims**



1. In an apparatus for detecting angular motion of a rotatable member, said apparatus including means for providing a path of light emissions, and light detecting means responsive to said path of light emissions for providing an electrical output corresponding to the detected emissions, the improvement comprising:

stationary optically apertured means disposed in said path of light emissions said stationary optically apertured means having a pattern radiating helically from a point on said stationary optically apertured means outward of alternating light permeable and opaque areas; and

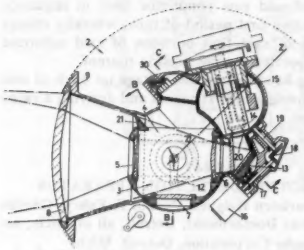
rotatable optically apertured means disposed in said path of light emissions and coupled to said rotatable member for rotation therewith, said rotatable optically apertured means having a pattern radiating helically from the axis of rotation of said rotatable optically apertured means outward of alternating light permeable and opaque areas, said helical patterns interacting in said path of light emissions for continuously varying the amount of light from said path detected by said light detecting means in response to rotation of said rotatable optically apertured means relative to said stationary optically apertured means.

3,935,448

OPTICAL SCANNING SYSTEMS

David Thomas Collier, Dunstable, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Aug. 6, 1974, Ser. No. 495,209
Claims priority, application United Kingdom, Aug. 6, 1973, 37191/73
Int. Cl.² H01J 3/14
U.S. Cl. 250—236 5 Claims



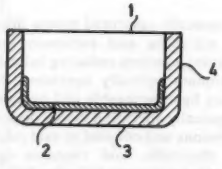
1. An optical scanning system comprising a head of generally spherical form having an objective lens set in its outer shell, an optical assembly mounted within the confines of said head and having at least one further lens in axial alignment with said objective lens, and a substantially annular scanner rotor and drive motor therefore also mounted within the confines of said head said rotor rotating about an axis which is oblique to the optical axis of said lenses and including a multi-faceted reflector the facets of which face inward toward said oblique axis to receive an image beam from said lenses and reflect it laterally on to means for processing the optical information it contains to provide a record or display.

3,935,449

METHOD FOR CALIBRATION MEASUREMENT IN A LIQUID SCINTILLATION COUNTER AND CARRIER USED IN THE METHOD

Matti Antero Reunanen, Abo, Finland, assignor to Wallac Oy, Abo, Finland

Filed Nov. 2, 1973, Ser. No. 412,351
Claims priority, application Sweden, Nov. 3, 1972, 14284/72
Int. Cl. G01t 1/00
U.S. Cl. 250—252 14 Claims



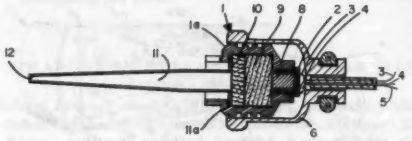
1. Method for feeding an accurately determined amount of radioactive substance to a fluid scintillation system for a calibration measurement in a liquid scintillation counter, the method comprising the steps of feeding of a carrier to said fluid scintillation system, said carrier having the radioactive substance adsorbed to it, and allowing said radioactive substance to dissolve in said fluid scintillation system.

3,935,450

APPARATUS AND METHOD FOR ALIGNING X-RAY DIFFRACTION CAMERA

A. Dale Spurgeon, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 12, 1974, Ser. No. 488,095
Int. Cl.² G01N 21/00
U.S. Cl. 250—273 12 Claims



1. A device for use in aligning an X-ray diffraction camera having first and second ports located in the same horizontal and vertical planes and positioned 180° from each other and a means for holding a sample for X-ray analysis disposed about midway between said ports and in axial alignment therewith comprising:

a. a hollow tube adapted to be disposed in said second port, said hollow tube being designed to extend from the point of entry into said camera to a point adjacent to said sample holding means, and an axially disposed chamber connected to and cooperating with said tube and designed to be positioned externally to said camera when said tube is disposed therein;

b. a fluorescent material disposed in said chamber adjacent to said tube, said material being tightly packed completely across said chamber; and

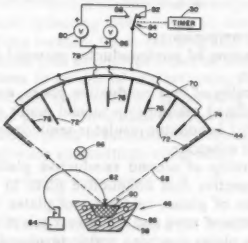
c. a conductive photo-cell disposed in said chamber immediately adjacent to said fluorescent material and on the side thereof opposite said tube.

3,935,451

METHOD AND APPARATUS FOR SEPARATING LASER IONIZED PARTICLES FROM BACKGROUND IONS

George Sargent Janes, Lincoln, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 328,954, Feb. 2, 1973. This application Sept. 7, 1973, Ser. No. 395,021
Int. Cl. H01j 39/34
U.S. Cl. 250—283 33 Claims



1. A method for separating ions produced at different times in a region defining an environment of particles of plural isotope types, comprising the steps of:

applying a first accelerating force in a first direction to the generally ionized particles of said environment;

selectively ionizing additional particles of a predetermined isotope type in said enviroment after the application of said first accelerating force, including the step of photo-exciting the additional particles;

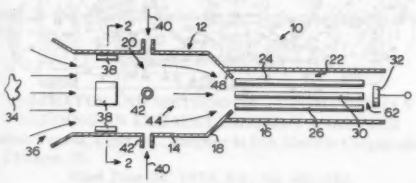
applying a second accelerating force of different direction to the charged particles of said environment after said

ionizing step; and collecting the secondly accelerated ionized particles.

3,935,452
QUADRUPOLE MOBILITY SPECTROMETER

Robert H. Prince, Unionville, Canada, assignor to Barringer Research Limited, Rexdale, Canada

Filed Nov. 14, 1973, Ser. No. 415,747
Int. Cl. H01j *39/34*; B01d *59/44*
U.S. Cl. 250—283 6 Claims



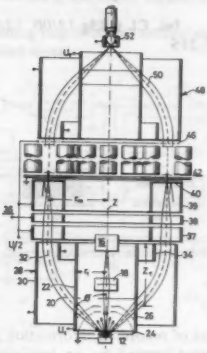
1. A method of analyzing predetermined molecular species present in a gas based on differences in molecular ion mobility of said molecular species comprising: ionizing said molecular species to form stable charged molecular ions, producing a flow of a carrier gas, causing said ions and carrier gas to flow in a stream, producing a transverse hyperbolic electric field in a region having a longitudinal axis, said field varying in time and quadratically with distance from said longitudinal axis and said field being defined by the sum of a sawtooth waveform having a predetermined amplitude and frequency and a sinusoidal waveform having a predetermined amplitude and frequency, directing said molecular ions through said region symmetrically about said longitudinal axis and detecting molecular ions which have passed through said region, whereby upon entry into said region the molecular ions undergo oscillatory trajectories, said trajectories being stable only for molecular ions of predetermined mobility and predetermined amplitudes and frequencies of said sawtooth and sinusoidal waveforms.

3,935,453
QUADRUPOLE FIELD MASS ANALYSER

Helmut Liebl, Eching, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Germany

Filed Sept. 17, 1974, Ser. No. 506,707
Claims priority, application Germany, Sept. 24, 1973, 2347946
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—292 9 Claims

1. A quadrupole field mass analyser comprising first electrode means for accelerating ions to be analysed, an annular entry gap for said ions, second electrode means for deflecting the ions coming through said entry gap into the form of a hollow parallel beam of annular cross-section, third electrode means for sub-dividing the hollow beam of ions into a plurality of component ion beams and for focussing said component ion beams in a plane substantially normal to their direction of travel, an energy diaphragm which passes only ions whose energies lie within a pre-determined energy range, a plurality of sets of quadrupole field electrodes aligned with respect to

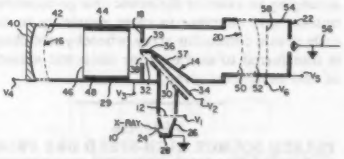


the component ion beams, and an ion detecting means for detecting ions emerging from the quadrupole fields.

3,935,454
ELECTRON COLLECTION IN ELECTRON SPECTROMETERS

Jerald Dana Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 28, 1974, Ser. No. 484,251
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—305 2 Claims



1. In apparatus for analyzing the energy distributor of electrons, said apparatus including an electron collector providing an otherwise field free region for the collection and detection of electrons, a source of electrons to be analyzed, a low pass filter for directing a selected portion of said electrons having kinetic energies below a first level toward said collector, and a high pass filter, having an exit electrical potential, for passing those of said electrons having a kinetic energy exceeding a second level less than said first level interposed between said low pass filter and said collector, said collector being a tubular, metallic reflecting chamber having an exit opening with an electron detector positioned thereat, the improvement wherein:

a grid is positioned within said chamber between said detector and said high pass filter at a higher electrical potential than said chamber, thereby to provide both accelerating and decelerating fields for said electrons.

3,935,455

METHOD AND APPARATUS FOR PRODUCING ELECTROSTATIC CHARGE PATTERNS

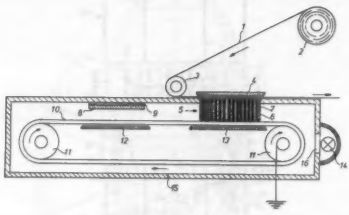
Jan Van den Bogaert, Schilde, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 30, 1973, Ser. No. 420,558

Claims priority, application United Kingdom, June 4, 1973, 26582/73

Int. Cl. G03g *13/00, 15/00*

U.S. Cl. 250—315 **21 Claims**



1. A method of recording information as a pattern of electrostatic charges carried by an insulating charge receiving medium which comprises:

a. exposing to a pattern of X-ray, γ-rays, or the like an imaging chamber enclosing a pair of spaced imaging electrodes and containing an ionizable gas having an atomic number of at least 36, which chamber is adapted to produce upon such exposure electrostatic charges therein in a corresponding pattern, while maintaining said gas during said exposure under superatmospheric pressure;

b. arranging interior dielectric charge receiving material within said chamber in a charge receiving position in the space between said electrodes;

c. applying a DC potential across said electrodes to bias said charge pattern onto a surface of said dielectric material;

d. displacing the charge-carrying dielectric material from said charge-receiving position to a charge-transferring position within said chamber, in which transferring position said charge-carrying dielectric surface is disposed in close proximity to the interior ends of an array of discrete closely spaced conductors extending from the interior to the exterior of said chamber; and

e. arranging an exterior dielectric charge-receiving material outside said chamber in close proximity to the exterior ends of said conductor array, whereby said charge pattern is transferred to said exterior dielectric material by way of said conductor array.

3,935,456

PULSED SOURCE HIGH-SPEED DRY PROCESS PHOTOGRAPHIC PRINTER PROCESSOR

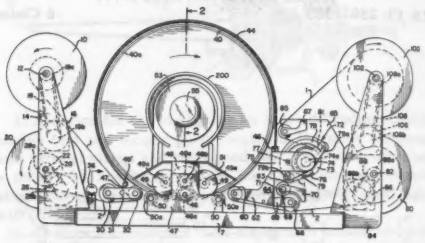
Nicholas G. Anton, Brooklyn, N.Y., assignor to The Eon Corporation, New York, N.Y.

Continuation of Ser. No. 115,813, Feb. 16, 1971, abandoned. This application June 13, 1972, Ser. No. 262,294

Int. Cl. G03g *17/00*

U.S. Cl. 250—316 **8 Claims**

1. Apparatus for exposing and developing at relatively high speed elongated web-type diazo type film to record information stored on an elongated web-type record carrier in segments which are defined by boundary markings comprising a transparent rotatable cylinder, means for feeding said film and said record carrier from separate locations to said cylinder to form a sandwich on said cylinder extending over an area of at least about 180° of the cylinder circumference to be moved with the cylinder as the cylinder is rotated, an elongated source of ultraviolet radiation within said cylinder, said lamp being of a length at least substantially equal to the width of said film rotating with said cylinder and mounted to transmit light to the entire portion of the sandwich of film and record carrier resting on said cylinder, means for rotating said cylinder without impeding the ultraviolet radiation transmitted from the source to the portion of the sandwich rotating with the cylinder, means for sensing the presence of at least one of said segments of information present on said record carrier which entire segment is located on said cylinder in a position



to be exposed by ultraviolet radiation from said source, means responsive to said sensing means for operating said source to produce a pulse of ultraviolet radiation for a duration sufficient to substantially "stop" and to expose the entire segment of film rotating with said cylinder with the information on the record carrier, means for applying heat to said exposed film to develop said film, and means for guiding only said exposed film to said heat applying means after both said record carrier and said film leave the cylinder.

3,935,457

DIELECTRIC MATERIAL FOR DOSIMETERS

Paul R. Moran, Madison, Wis.; Ervin Podgorsak, Toronto, Canada; Gary D. Fullerton, Madison, Wis., and Gene E. Fuller, Ridge, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 16, 1974, Ser. No. 497,874

Int. Cl. G01t *1/16*

U.S. Cl. 250—336 **13 Claims**

1. In the measurement of radiation, a dosimeter which makes use of a dielectric material in which the level of active impurities total less than 50 ppm, and in which the level of any one active impurity does not exceed 10 ppm.

3,935,458

METHOD FOR MONITORING THE SURFACE RESISTIVITY OF METALLIZED FILM

Dan William Peters, Mountain View, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

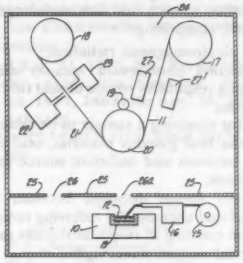
Continuation of Ser. No. 58,305, July 27, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,904

Int. Cl.² G01J *1/00*

U.S. Cl. 250—338 **20 Claims**

1. A process useful in monitoring the surface resistivity distribution of the deposit obtained by the vacuum deposit of a metal selected from the group consisting of silver, gold and copper on a transparent plastic film carrier to form a metallized plastic film having luminous light transmission greater than about 20 percent comprising applying electro-magnetic radiation comprised of radiation within the wavelengths of about 1.5 to 3.0 microns to the metallized film, detecting a signal corresponding to a wavelength interval of electro-mag-

netic radiation within the range of about 1.5 to 3.0 microns transmitted through said film and deposit, and correlating the



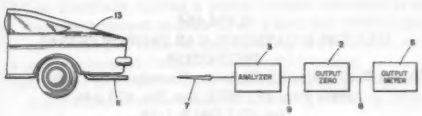
value of the detected signal to the surface resistivity of the film.

3,935,459

APPARATUS AND METHOD OF AUTOMATICALLY ZEROING AN EXHAUST EMISSION ANALYZER

Zoltan Voross, Elgin, Ill., assignor to Sun Electric Corporation, Chicago, Ill.

Filed June 24, 1974, Ser. No. 482,444
Int. Cl.² G01N *21/26*
U.S. Cl. 250—343 **18 Claims**



1. An automatic output zeroing apparatus for an exhaust emission analyzer having output means, said exhaust emission analyzer generating a free air voltage during analysis of open environmental air and a pollution-indicating voltage during analysis of air exhausted from an automobile, comprising, in combination:

means for retrievably storing a first voltage proportional to said free air voltage;

switch means operable in a first state for connecting said storing means to said exhaust emission analyzer and operable in at least a second state for disconnecting said storing means from said exhaust emission analyzer, said switch means being operated in said first state during analysis of said open environmental air and in said second state during analysis of said exhausted air; and

means for summing a second voltage proportional to said pollution-indicating voltage and said first voltage to produce an output signal, said output means being responsive to said output signal, said output signal representing the difference between said second voltage and said first voltage, said summing means being responsive to said exhaust emission analyzer and said storing means.

3,935,460

PROCESSING APPARATUS FOR CLEAR AIR TURBULENCE DETECTION

Edward F. Flint, 920 Glencliff Drive, La Habra, Calif. 90631

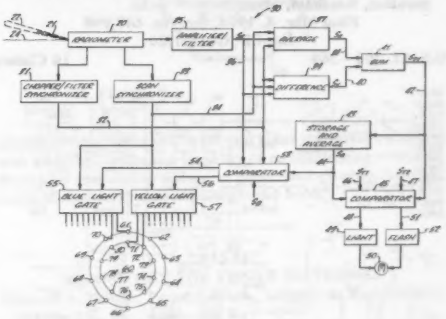
Filed Feb. 10, 1975, Ser. No. 548,874
Int. Cl.² G01J *1/00*
U.S. Cl. 250—349 **9 Claims**

1. In an atmospheric turbulence detection system for use in an aircraft including at least one radiometer for continuously providing a plurality of independent and discrete temperature measurement signals within a given field of view ahead of said aircraft, apparatus for processing said signals to derive an atmospheric turbulence warning comprising:

means for deriving consecutive first signals indicative of the average temperature within said field of view;

means for deriving consecutive second signals indicative of the difference between said temperature measurement signals in two vertically displaced regions within said field of view;

means for combining said first and second signals to derive consecutive third signals;



means for storing consecutively derived third signals for a predetermined period of time and for continuously deriving a fourth signal indicative of the average of said stored third signals; and

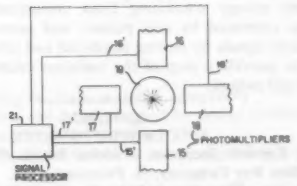
means for comparing each newly derived third signal with said fourth signal and generating a turbulence warning upon the occurrence of a predetermined difference therebetween.

3,935,461

SCINTILLATING CAMERA

Hugo Vlasbloem, Maasland, Netherlands, assignor to N.V. Optische Industrie "de Oude Delft", Delft, Netherlands

Filed Feb. 27, 1974, Ser. No. 446,470
Claims priority, application Netherlands, Mar. 9, 1973, 7303407
Int. Cl.² G01T *1/20*
U.S. Cl. 250—368 **8 Claims**



1. Apparatus for determining the position of a light pulse emitting point on the anode screen of an image intensifier tube forming a part of a scintillating camera comprising at least three photomultipliers, circuit means operatively connecting said photomultipliers to derive voltages representative of the position coordinates, said circuit means including a pulse height discriminator circuit for gating said circuit means responsive to signals in a predetermined amplitude range derived from said photomultipliers, said device being characterized by distortion compensating means for transferring to said photomultipliers the image produced on said anode screen, said distortion compensating means comprising a reflecting surface symmetrical with respect to the said anode screen and the photocathodes of said photomultipliers, said surface being positioned to reflect light emitted by said anode screen to said

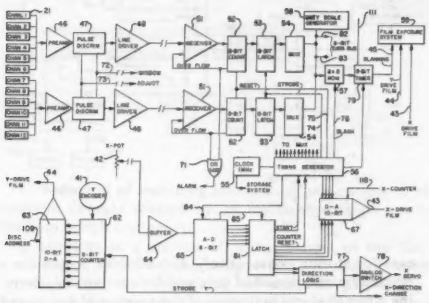
photocathodes, said surface being configurated and spaced relative to said anode screen and photomultipliers to vary the intensity of an image reflected on said photocathodes as a function of the position on said anode of a light emitting point of constant brightness.

3,935,462

WHOLE BODY IMAGING

Peter C. de Luca, Medfield; Hugh F. Stoddart, Groton, and David Jeffries, Milton, all of Mass., assignors to Cleon Corporation, Needham, Mass.

Filed Mar. 4, 1974, Ser. No. 447,990
Int. Cl.² G01T *1/20*
U.S. Cl. 250—369 **10 Claims**



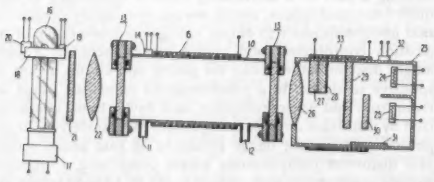
8. A method of diagnosing a patient which method includes the steps of, injecting a radioactive substance into a patient, placing said patient upon patient support means with the length of the patient aligned along a longitudinal direction facing a plurality of spaced radiant energy detecting means aligned along a curve in a direction generally transverse to said longitudinal direction, moving said detecting means back and forth along said curve to scan substantially the entire projection of said curve upon said patient while also advancing said detecting means along said longitudinal direction at a speed less than that of the speed of said detecting means along said curve to scan the whole body of said patient with each detecting means scanning only a lengthwise strip of said patient different from the longitudinal strip scanned by the other detecting means while providing respective signals representative of radiant energy emanating from correspondingly spaced points embraced by said patient, and processing said respective signals by storing positional and intensity information to provide a map of the radiation intensity emanating from said patient.

3,935,463

SPECTROPHOTOMETER

John Kenneth Jacobsen, Madeira Beach, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Dec. 5, 1974, Ser. No. 529,838
Int. Cl.² G01J *3/00, 3/46, 5/56*; G01N *21/26*
U.S. Cl. 250—373 **25 Claims**



1. Non-dispersive spectrometric apparatus for detecting the presence of a first gaseous material despite the presence of a second gaseous material, said first gaseous material absorbing electromagnetic radiation at a relatively high rate at a first wavelength, said second gaseous material absorbing electromagnetic radiation at both said first wavelength and at a second wavelength, comprising:

a source of electromagnetic radiation;

first and second photosensor means, said photosensor means being responsive to one of said first or said second wavelengths;

a chamber for receiving a sample to be tested for the presence of the first gaseous material, said chamber being disposed between said radiation source and said photosensor means;

first phosphor means disposed between said radiation source and said chamber for receiving radiation from said source and emitting in response thereto radiation at said first and said second wavelengths;

filter means disposed between said first photosensor means and said chamber for substantially attenuating radiation at that wavelength to which said photosensors are responsive, and passing the other of said wavelengths;

second phosphor means disposed between said first photosensor means and said filter means and responsive to said other of said wavelengths to produce radiation of the wavelength to which said photosensors are responsive; and

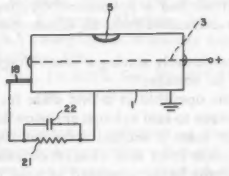
means coupled to said first and said second photosensor means for comparing the relative responses thereof to impingent radiation.

3,935,464

MULTIPLE CATHODE GAS PROPORTIONAL DETECTOR

William P. Zingaro, 22 Clubway, Hartsdale, N.Y. 10530

Filed Dec. 17, 1973, Ser. No. 425,246
Int. Cl.² G01T *1/18*
U.S. Cl. 250—379 **7 Claims**



1. A pulse-type detector for detecting ionizing radiation comprising a substantially cylindrical envelope having a wall constituting a substantially cylindrical electrode coaxial with said envelope and having a window therein for admitting ionizing radiation, an ionizable gas within said envelope, said cylindrical envelope being closed at both ends by end walls, a central wire electrode extending axially within said envelope, an auxiliary electrode disposed between said central wire electrode and the wall electrode, means to apply a negative potential between said wall electrode and said central wire electrode at which electrical pulses proportional to the intensity and energy of radiation absorbed by the gas are produced, and means comprising a parallel resistance-capacitor network to apply a negative potential between said wall electrode and said auxiliary electrode at which positive ions produced when said gas is ionized are neutralized by said auxiliary electrode, said negative potential between said wall electrode and said auxiliary electrode being less than said negative potential between said wall electrode and said central wire electrode.

3,935,465
IONIZATION ANALYZING AIR POLLUTION, SMOKE AND FIRE ALARM DEVICE

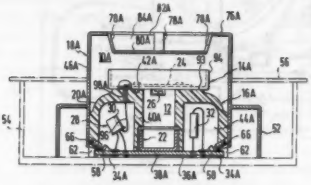
Hartwig Beyersdorf, Scharbeutz, Germany, assignor to GEBA-Gesellschaft fuer Elektronische Brandmeldeanlagen mbH, Hamburg, Germany

Filed Apr. 11, 1974, Ser. No. 460,041

Claims priority, application Germany, Apr. 24, 1973, 2320604; Jan. 24, 1974, 2403418; Apr. 24, 1973, 7315459; Jan. 24, 1974, 7402420

Int. Cl.[2] G01T 1/18; H01J 39/28

U.S. Cl. 250—384 **23 Claims**



1. An ionization analyzing air pollution and fire alarm signal device comprising:

a symmetrical housing including an outer wall and a peripheral cover with a central opening permitting passage of ambient air therethrough;

at least two electrodes;

a first electrode, having a planar portion mounted in said housing adjacent said cover of a size and surface shape conforming to those of said opening in said cover; and

a second electrode located within said housing;

one end of said outer wall of said housing projecting axially beyond said first electrode and forming a sealing support for the outer edge of said cover;

spacers with apertures between them connecting said housing with said first electrode;

said cover defining together with said first electrode a baffle zone;

said cover, the planar portion of said first electrode and said second electrode mounted in planes parallel to each other perpendicularly to the axis of said housing and spaced from each other distances permitting passage of ambient air from said baffle zone and from there between said two electrodes;

the walls of said housing defining together with the said two electrodes a partially closed first chamber protected from excessive fluctuations of ambient air by said baffle zone;

a first radio-active source for ionizing said first chamber, and

an electrical circuit connected to said two electrodes and being responsive to changes in electrical characteristics of the atmosphere in said first chamber.

3,935,466
SMOKE DETECTOR ADAPTED TO A SMOKE SENSING APPARATUS

Yukio Tomioka, Sagamihara, Japan, assignor to Hochiki Kabushiki Kaisha, Tokyo, Japan

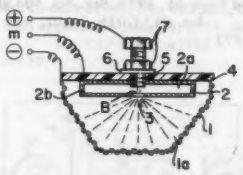
Continuation of Ser. No. 860,357, Sept. 23, 1969, abandoned. This application June 18, 1971, Ser. No. 440,521

Claims priority, application Japan, Sept. 26, 1968, 43-69696; Mar. 11, 1969, 44-18458

Int. Cl.[2] G01T 1/18

U.S. Cl. 250—385 **6 Claims**

1. An ionization-type smoke detector comprising: an inner electrode provided with a radioactive source; an intermediate electrode having at least one through-hole; and an outer electrode having openings through which smoke can enter; said inner electrode and said intermediate electrode forming an inner ionization chamber in which said radiation source is arranged, said intermediate electrode and said outer electrode forming an outer ionization chamber, said inner ionization



chamber being arranged inside said outer ionization chamber, and wherein a necessary quantity of radioactive rays emitted from said radioactive source is introduced directly into said outer ionization chamber through said holes.

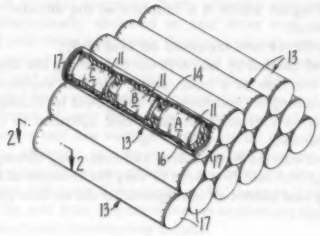
3,935,467
REPOSITORY FOR FISSILE MATERIALS

Kenneth A. Gablin, Tacoma, Wash., assignor to Nuclear Engineering Co., Inc., Louisville, Ky.

Continuation of Ser. No. 414,345, Nov. 9, 1973, abandoned, which is a continuation of Ser. No. 157,105, June 28, 1971, abandoned. This application July 1, 1974, Ser. No. 484,422

Int. Cl. G21f 3/00

U.S. Cl. 250—507 **5 Claims**



1. A repository for fissile material, comprising

a plurality of metal drums adapted for sealed containment of fissile materials and the like,

said drums being positioned in axially aligned and spaced relation,

an elongated cylindrical rigid tube surrounding said drums in concentrically spaced relation thereto and formed of bituminized fibre material,

end caps of exterior grade plywood treated with wood preservative secured in sealing relation to the opposite ends of said cylindrical tube,

and a continuous body of foamed polyurethane material occupying the space between said drums and the spaces between said drums and said cylindrical tube and endcaps,

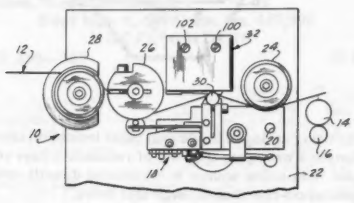
said polyurethane material being adherent to said drums and tube and endcaps and of substantial stiffness to provide a reinforcing action,

said polyurethane material being formed in situ to provide multiple small voids therein except adjacent to said drums and tubes and endcaps.

3,935,468
LIGHT RESPONSIVE DETECTOR

Howard Bowen, Wilmette, and Frederick W. Spinner, Elk Grove Village, both of Ill., assignors to Research Technology Incorporated, Skokie, Ill.

Filed Sept. 11, 1974, Ser. No. 504,980
Int. Cl.² G01N *21/30*
U.S. Cl. 250—572 **18 Claims**



14. A film inspection device for detecting flaws in motion picture film traveling over a film support, comprising:

a body adapted to be mounted above and adjacent the film support, said body including

a first bore defining a light pssageway,

a second bore intersecting said first bore, and

a slot intersecting said first bore at a point spaced from said second bore;

a lamp mounted in said second bore on one side of said slot and extending into and directing a light beam through said first bore;

a photocell mounted in said first bore on the other side of said slot to receive the light beam and produce an electrical signal which is a function of the amount of light received;

a cantilever arm mounted on said body;

a jewel carried by said arm for contacting the upper surface of the film at a point above the film support, said arm including an aperture and said jewel including a reduced portion extending through said aperture to contact the film; and

a vane carried by said arm and extending through said slot and into said first bore to vary the amount of light reaching said photocell in response to the surface profile of the film.

3,935,469
POWER GENERATING PLANT

James Livesey Haydock, Toronto, Canada, assignor to Acres Consulting Services Limited, Toronto, Canada

Filed Jan. 29, 1974, Ser. No. 437,710
Claims priority, application United Kingdom, Feb. 12, 1973, 648/73
Int. Cl.² F01D *15/10*; F02C *7/02*; H02K *7/18*; H02P *9/04*
U.S. Cl. 290—52 **10 Claims**

1. An electrical power generating plant having alternate generating and energy storage modes of operation, comprising:

a pressurized-air fuel gasifier for producing a high pressure stream of combustible gas;

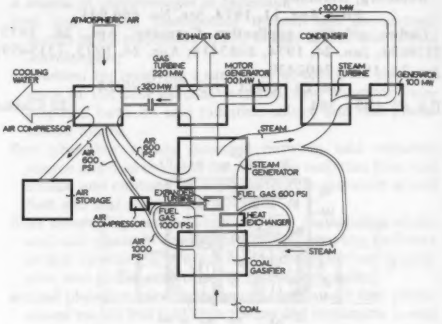
combustion means for combusting said gas to generate a waste gas stream;

a gas turbine driven by the waste gas stream;

a main electric generator coupled to the gas turbine to be driven thereby;

a first air compressor coupled to the gas turbine by coupling means including a disconnectible clutch, the clutch being disengaged during the generating mode of operation and being engaged during the energy storage mode of operation to drive the compressor;

an underground air storage reservoir connected to the air compressor to receive compressed air therefrom during said storage mode; and

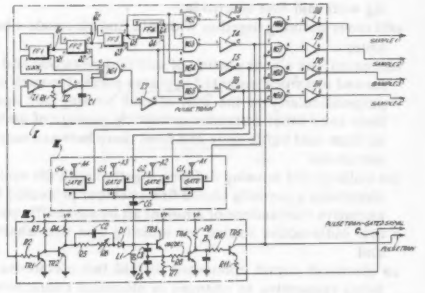


means for delivering compressed air from the air storage reservoir to the gasifier and said combustion means.

3,935,470
MULTIPLEXED SIGNAL-SEQUENCE CONTROL SYSTEM

Arthur F. Cake, Smithtown, N.Y., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Aug. 7, 1974, Ser. No. 495,436
Int. Cl.² B60R *21/10*
U.S. Cl. 307—105 B **20 Claims**



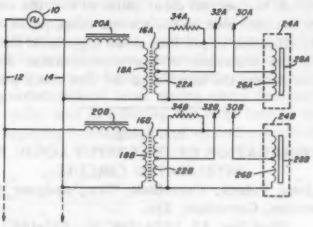
1. A multiplexed signal-sequence control system comprising:

1. first circuit means operative, when fully energized, to generate a multiplexed output signal comprising a plurality of component signals each representative of the presence or absence of a signal of the first class; and
2. second circuit means operative to receive a plurality of signals of the second class and, upon receiving a signal of the second class, further operative to fully energize said first circuit means and to process signals of the first and second classes in that order, and further operative to generate a control signal in response to (a) one or more signals of only the first class or only the second class, (b) unrelated signals of both the first and second classes, or (c) related signals of both the first and second classes occurring in an improper sequence.

3,935,471
CURRENT LIMITING POWER SUPPLY

Marion M. Bishop, Seattle, and Walter Robert Weist, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 15, 1975, Ser. No. 541,263
Int. Cl.² H02J 3/00
U.S. Cl. 307—32 4 Claims

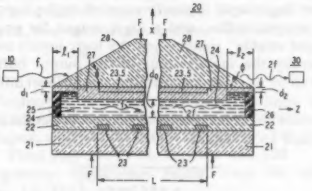


1. A power supply system in combination with a plurality of loads comprising a source of alternating current voltage, separate transformers equal in number to the number of loads connecting said source of alternating current voltage to the respective loads, primary and secondary windings for each of said transformers, inductors connected in series with the respective each primary windings across said source of alternating current voltage, each of said loads comprising a sensing device connected across each of said secondary windings, and cores of saturable magnetic material inductively coupled to the respective primary and secondary windings.

3,935,472
THIN FILM LIQUID WAVEGUIDE OPTICAL CONVERTER

Clyde G. Bethea, East Orange; Barry Franklin Levine, Westfield, and Ralph Andre Logan, Morristown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1975, Ser. No. 558,424
Int. Cl.³ G02B 5/14; G02F 1/37
U.S. Cl. 307—88.3 10 Claims



7. Thin film apparatus which comprises:

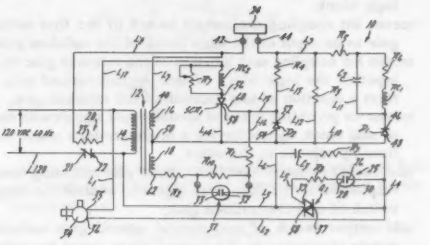
a. a thin film optical waveguide structure including a liquid film, which exerts a significant waveguiding effect on an input optical wave coupled into the thin film waveguide structure for propagation along a first direction, said liquid having a significant optically nonlinear coefficient; and

b. spatially periodic electrode means in a neighborhood of the liquid film for producing a periodic electric field in the liquid film having a spatial periodicity along the first direction in order to favor a parametric interaction which yields an output optical wave of frequency different from that of the input.

3,935,473
SOLID STATE STACK SWITCH CONTROL SYSTEM

Frederick T. Bauer; Anthony C. Cairo; Ronald E. Holkeboer, all of Holland, and Gary E. Tyler, Wyoming, all of Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 422,225, Dec. 6, 1973, abandoned. This application June 24, 1974, Ser. No. 482,203
Int. Cl.² H01H 47/26
U.S. Cl. 307—117 7 Claims

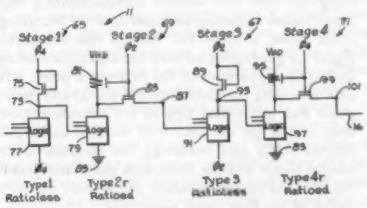


1. In a stack control system for furnaces, the combination including burner control means adapted to be connected to a main line source of AC current, a low voltage control circuit including thermally activated, magnetically operated heat detection means, said heat detection means including a bimetallic actuating member movable in response to thermal changes, a reed switch, and magnetic means movable in response to movement of said actuating member and effective to actuate said reed switch, said magnetic means including a magnetic body defining an opening therethrough, a drive arm formed of magnetic material and extending through the opening defined by said magnetic body whereby said magnetic body is magnetically clutched to said drive arm, one end portion of said drive arm being fixed to said actuating member, stop means limiting movement of said magnetic body relative to said reed switch while permitting de-clutching of said magnetic body with respect to said drive arm and continued movement of said drive arm relative to said magnetic body, means in said low voltage control circuit including solid state means effective to actuate said burner control means, circuit interrupting means effective to interrupt the flow of current from said main line source of AC current, and means controlled by said heat detection means controlling the actuation of said circuit interrupting means.

3,935,474
PHASE LOGIC

James A. Komarek, Newport Beach, Calif., assignor to Hycom Incorporated, Irvine, Calif.

Filed Mar. 13, 1974, Ser. No. 450,826
Int. Cl.² H03K 19/08, 19/3619/40; G11C 19/28
U.S. Cl. 307—205 16 Claims



1. A logic cell comprising:

first and second ratioed gates, each of said ratioed gates including a logic block and an impedance means coupled

to the logic block, each of said logic blocks being coupled to a reference potential whereby the impedance means and the logic block can serve as a voltage divider and the state of the logic block affects the potential at a location between the impedance means and the logic block;

each of said first and second ratioed gates including an output switch coupled to said location of the associated ratioed gate to form a junction at said location;

a ratioless gate including a logic block, a switch coupled to the logic block, and a location between the switch and the logic block;

means for coupling the output switch of the first ratioed gate to an input of the logic block of the ratioless gate;

means for coupling said location of the ratioless gate to an input of the logic block of said second ratioed gate to form a junction at said location of the ratioless gate;

means for providing first and second clock signals with each of said clock signals having a predetermined phase relationship relative to the other;

said output switch of said first ratioed gate including means responsive to the first clock signal to control the output switch of said first ratioed gate;

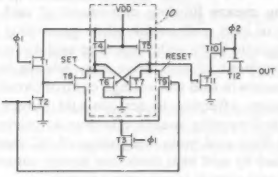
said output switch of said second ratioed gate including means responsive to the second clock signal to control the output switch of the second ratioed gate; and

said switch of said ratioless gate including means responsive to the first clock signal to control said switch of said ratioless gate.

3,935,475
TWO-PHASE MOS SYNCHRONIZER

Arthur Margolies, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 27, 1974, Ser. No. 500,988
Int. Cl.² H03K *19/08, 3/26*
U.S. Cl. 307—208 **5 Claims**



1. A circuit for synchronizing an asynchronous signal in a system having at least alternating first and second clock pulses for clocked ratio logic comprising:

a. bistable means receiving first and second complementary signals for establishing the state of said bistable means and generating an output signal reflecting the state of said bistable means;

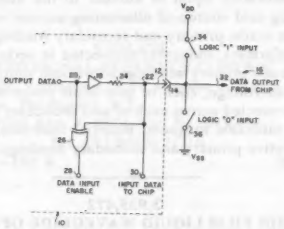
b. input means receiving the asynchronous signal and generating the first and second complementary signals, the input means including an input inverter receiving the first clock pulse, a single DC voltage and the asynchronous signal for generating an inverted asynchronous signal only during the occurence of the first clock pulse, a first AND gate receiving the asynchronous signal and the first clock pulse and generating one of the complementary signals only during the occurence of the first clock pulse and a second AND gate receiving the inverted asynchronous output signal and the first clock pulse and generating the other of the complementary signals only during the occurence of the first clock pulse; and

c. output means receiving the output signal from the bistable means and generating a high drive, circuit output signal having one of two predetermined voltage levels whose transitions correspond generally to those of the asynchronous input and are synchronized to the clock pulses, the output means including an output inverter receiving the single DC voltage, the second clock pulse and the output signal of the bistable means for generating an inverted output signal only during the occurence of the second clock pulse, the inverter being effective to produce an output having high drive capability to protect the bistable means from loading effects of the output of the circuit, and an output field effect transistor connected to the output of the output inverter and receiving at a gate electrode the second clock pulse so that the output transistor is controlled by the second clock pulse, the circuit being effective to produce a full logic level output signal when the transition of the asynchronous input signal occurs during the interval of the first clock pulse.

3,935,476
COMBINATION OUTPUT/INPUT LOGIC FOR INTEGRATED CIRCUIT

Robert John Paluck, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Dec. 13, 1974, Ser. No. 532,406
Int. Cl.² H03K *19/08, 19/32*
U.S. Cl. 307—213 **3 Claims**



1. In integrated logic circuits, the combination of:

a data pin for transferring data between the integrated logic circuit and an external logic circuit;

an output buffer having a logic input and a logic output, the logic output being connected to the data pin;

comparator logic means having one logic input logically coupled to the logic input of the output buffer and another logic input logically coupled to the logic output of the output buffer, and a logic output for producing an "input enable" signal when the logic inputs are different whereby the logic output of the output buffer can be driven by an external circuit to a logic level different from that applied to the logic input of the output buffer to produce an input enable signal at the output of the comparator logic means.

3,935,477
ANALOG INVERTER FOR USE IN CHARGE TRANSFER APPARATUS

Robert Joseph Strain, Plainfield, and Robert Henry Walden, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 353,629, April 23, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,848
Int. Cl.² H03K *19/40*; H01L *27/04, 29/80*
U.S. Cl. 307—214 **6 Claims**

1. Charge transfer apparatus for producing the analog inversion of a non-self-strobing electrical signal comprising:

a storage medium having a major surface,

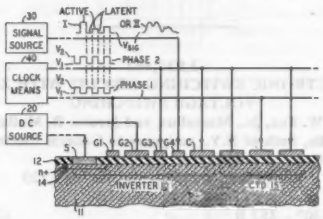
an insulative layer formed on at least a portion of said major surface,

source means including a source electrode in operative relation with said medium for injecting mobile charge carriers into said medium,

a first control electrode, a reference electrode, a second control electrode, a signal electrode and a collector electrode formed in tandem on said insulative layer, said first control electrode being located between said source and reference electrodes,

means for producing a reference potential well in said medium under said reference electrode,

two phase clock means for: (1) during a first half of the clock cycle, applying a voltage to said first control electrode effective to cause mobile charge carriers to be injected from said source means into said reference well, said reference well being filled with said carriers to the same predetermined level during every first half of the clock cycle; and (2) during the next half of the clock cycle, applying a voltage to said second control electrode



and said collector electrode effective to form in said medium a collecting potential well under siad collector electrode and a potential barrier under said signal electrode and between said reference well and said collecting well, said barrier tending to impede the flow of said mobile charge carriers from said reference well to said collecting well; said clock means and said second control electrode being effective to inhibit the flow of charge carriers from said reference well to said collecting well during said first half of the clock cycle and being effective to sample said non-self-strobing signal when it is a purely analog signal; and

means for applying, during at least said next half of the clock cycle, said non-self-strobing electrical signal to be inverted to said signal electrode, thereby varying the height of said potential barrier and causing an amount of charge, the inverted charge, proportional to said analog inversion of said electrical signal to flow out of said reference well, over said barrier and into said collecting well.

3,935,478

NON-LINEAR AMPLIFIER

Takashi Okada, Yamato, and Kimitake Utsunomiya, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 29, 1974, Ser. No. 492,838

Claims priority, application Japan, Aug. 10, 1973, 48-90150; Aug. 10, 1973, 48-90151

Int. Cl.² G06G 7/12

U.S. Cl. 307—229 **6 Claims**

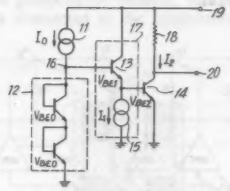
2. A non-linear amplifier, comprising:

an amplifying transistor for amplifying an input signal;

an input terminal for receiving said input signal, said input terminal being connected to said amplifying transistor;

a series of $(n-1)$ P-N junctions connected in series with the P-N junction defined by the base-emitter junction of said amplifying transistor for providing a predetermined bias voltage for said amplifying transistor, and wherein n is an integer greater than unity; and

emitter-follower means connected to said input terminal, said emitter follower means comprising $(n-1)$ emitter-follower transistors connected in cascade such that the base-emitter junctions of said emitter-follower transistors form a first path which is in parallel with a second path



defined by said amplifying transistor and series of P-N junctions such that said input signal is amplified by the power of $1/n$.

3,935,479

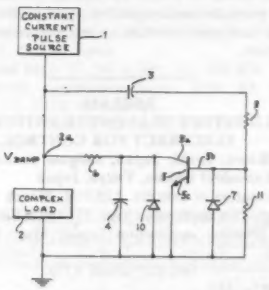
DYNAMIC DAMPING APPARATUS

John H. Andreasen, St. Paul, and James A. Howe, Burnsville, both of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 535,061

Int. Cl.² H03K 5/08

U.S. Cl. 307—237 **2 Claims**



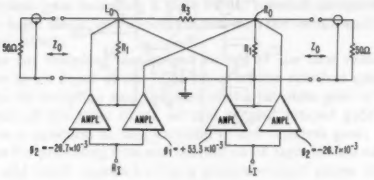
1. Dynamic damping apparatus being comprised of a source of constant current pulses, a complex load having an input terminal and receiving said constant current pulses thereat, first, second, and third preselected resistors, each having a different predetermined resistive value, a first and second preselected capacitor, each having a different predetermined capacitive value, a transistor having an emitter, collector, and base, said emitter being connected directly to ground, said collecter being connected to said input terminal by way of said first resistor and to ground by way of said first capacitor, said base being connected to said input terminal by way of a series arrangement of said second capacitor and said second resistor, and also connected to ground by way of said third resistor, and a first diode connecting said base to ground, the current being damped during the rise and fall of the current with the current being unaffected by voltage variation of said complex load during the flattop portion of the constant current pulses.

3,935,480

BROAD BAND DIRECTIONAL SIGNAL GENERATOR

Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1974, Ser. No. 484,032
Int. Cl.² H03K 17/00
U.S. Cl. 307—241 19 Claims



1. A broad band directional signal generator for generating signals on a transmission line or the like which, controllably, propagate in one direction on the line due to reinforcement of signals to the exclusion of the other direction due to cancellation of signals, or simultaneously, in opposite directions, comprising:

a. an attenuator network employing linear, nonreactive impedance elements for insertion in said transmission line, said impedance elements forming at least first and second nodes;

b. at least a first input terminal for receiving a first signal which is to propagate in said one direction on said transmission line; and

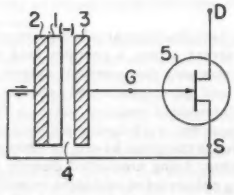
c. first isolation means for coupling said first input terminal to said first node and for coupling said first input terminal to said second node, said first isolation means coupling said first signal at said first input terminal to said first and second nodes in a first predetermined ratio to cause a signal proportional to said first signal to propagate on said line in said one direction to the exclusion of said other direction.

3,935,481

FIELD EFFECT TRANSISTOR SWITCH WITH ELECTRECT FOR CONTROL

Shoji Uchikawa, Iwaki, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 125,791, March 18, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,297
Claims priority, application Japan, Mar. 19, 1970, 45-22660
Int. Cl.² H03K 17/68
U.S. Cl. 307—251 4 Claims



1. A method for controlling the ON-OFF state of an electric switching circuit including a MOS type field effect transistor having gate, source, and drain electrodes and having a threshold level above which said transistor is in the ON conducting state, an electret and an induction electrode, comprising the steps of;

coupling said induction electrode in an operable relationship to the gate electrode of said field effect transistor;

coupling said electret in an operable relationship to the source electrode of said field effect transistor;

positioning said electret with respect to said induction electrode in a first spaced apart relationship such that said electret and induction electrode are electrostatically coupled and the electric field therebetween induces a voltage between the gate and source of said field effect transistor that is below the threshold level of said field effect transistor whereby said field effect transistor is in the OFF conducting state, and

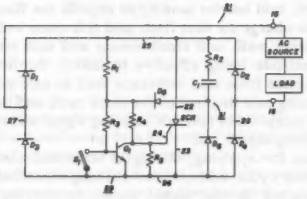
positioning said electret with respect to said induction electrode in a second spaced apart relationship such that said electret and induction electrode are electrostatically coupled and the electric field therebetween induces the gate-source voltage that is above the threshold level of said field effect transistor whereby said field effect transistor is in the ON conducting state.

3,935,482

ELECTRONIC SWITCHING CIRCUIT WITH ZERO VOLTAGE SWITCHING

Richard W. Fox, Jr., Marcellus, and Jerome R. Mullaly, Baldwinsville, both of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,223
Int. Cl.² H03K 17/72
U.S. Cl. 307—252 B 12 Claims



1. Electronic switch circuit apparatus comprising:

input terminals coupled to an A.C. controlled circuit;

a switching thyristor comprising two switch terminals electrically coupled to said input terminals and also comprising a trigger terminal for receiving a trigger signal, said thyristor controlling the controlled circuit in response to trigger signals received at said trigger terminal;

trigger means coupled to said trigger terminal for selectively supplying trigger signals;

power supply means including a capacitor and a rectifier, said rectifier being coupled to said switch terminals and drawing power from the controlled circuit;

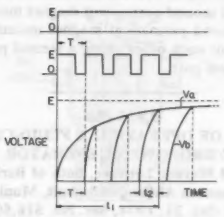
means electrically coupling said capacitor to said trigger means for supplying stored power to generate an initial trigger signal before said thyristor has been fired, and for enhancing the power to generate a subsequent trigger signal after said thyristor has been extinguished and while said capacitor begins to recharge; and

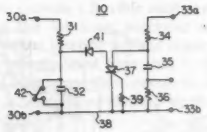
means electrically coupling said capacitor across said switch terminals for enabling said capacitor to discharge through said thyristor immediately after said thyristor fires in response to a trigger signal.

3,935,483
PHASE SHIFTING CIRCUIT

Kazuyuki Arimoto; Toshinobu Maeda; Fuzio Hori, and Akihiko Takata, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 25, 1974, Ser. No. 445,159
Claims priority, application Japan, Feb. 26, 1973, 48-22874
Int. Cl.² H03K 1/16
U.S. Cl. 307—295 6 Claims





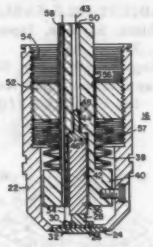
1. A phase shifter comprising, a first exponential generator including a constant voltage source and a timing circuit responsive to the constant voltage source to generate a first exponential voltage curve, a second exponential generator including a pulse generating source to generate second exponential voltage curves, a solid-state switching device responsive to the outputs from said first and second generators to provide coincidence therebetween repetitiously when the voltages of the first and second curves reach the same level, whereby the point of coincidence varies linearly with time, and a load impedance responsive to the output from said switching device to develop the coincidence output.

3,935,484
REPLACEABLE ACOUSTIC TRANSDUCER ASSEMBLY

Walter C. Leschek, Pittsburgh, Pa., and Philip E. Carpentier, Elmira, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1974, Ser. No. 445,523
Int. Cl.² H01V 7/00
U.S. Cl. 310—8.2 14 Claims

1. An acoustic transducer assembly comprising:
a generally tubular metal enclosure member,
a transducer window and piezoelectric element assembly sealingly disposed at one end of the tubular enclosure, wherein the transducer window is a high temperature resistant metal disk sealed to the tubular enclosure member with a high acoustic energy transmissive thin insulating disk acoustically coupled to the interior surface of the metal disk, and the piezoelectric element is a thin disk acoustically coupled to the other side of the insulating disk,
an elongated conductive acoustic energy damping element in contact with the side of the piezoelectric element facing inwardly within the tubular enclosure member,
an elongated insulating plug fitting within the tubular enclosure member about the damping element,
compressive spring means within the enclosure member for compressively holding the insulating plug against the damping element and thereby compressing the damping element against the piezoelectric element,
a pair of electrical conductors extending through the insulating plug, one conductor electrically connected to one side of the piezoelectric element, the other conductor electrically connected to the conductive damping element,

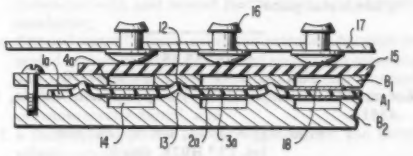


a closure plug movably fitted in the other end of the tubular metal enclosure member, which plug is movable along the axis of the tubular metal enclosure member to engage one end of the compressive spring means, which thereby compresses the damping element against the piezoelectric element which is in turn compressed against the transducer window, which compression means thereby electrically and acoustically couples the damping element, the piezoelectric element and the transducer window

3,935,485
PIEZOELECTRIC KEY BOARD SWITCH

Masafumi Yoshida; Masahiro Segawa, and Hiroshi Obara, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,814
Claims priority, application Japan, Sept. 17, 1973, 48-104681; Oct. 22, 1973, 48-118801
Int. Cl.² H01L 41/04
U.S. Cl. 310—8.5 16 Claims



1. A key board switch comprising
a polarized polymer film element A having in the surface of the polymer piezoelectric film, a plurality of piezoelectric unit elements satisfying the following condition:
a. said unit elements have electrodes on both surfaces thereof,
b. the portions of the polymer film of said piezoelectric unit elements held between the electrodes on both surfaces have piezoelectric properties and
c. any two piezoelectric unit elements are electrically independent from each other at least with respect to electrodes on one surface; and
a substrate sheet B on which the polymer film element A is laid and having windows or recesses in positions corresponding to each of the piezoelectric unit elements of the polymer film element A, those portions of the polymer film between adjacent piezoelectric unit elements in the

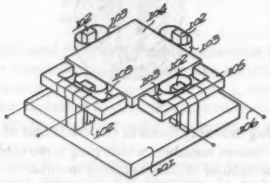
polymer element A being secured to the substrate B at positions between the windows or recesses in the substrate B so as to prevent a stress applied to one of the unit elements from being transmitted to another unit element whereby changes in the electric field generated from each of the piezoelectric unit elements can be an independent output.

3,935,486

FINELY ADJUSTABLE TABLE ASSEMBLY

Mitsuyoshi Nagashima, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,345
Claims priority, application Japan, Aug. 27, 1973, 48-95844
Int. Cl.² H02K 41/02
U.S. Cl. 310—12 2 Claims



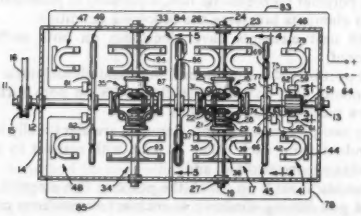
1. A finely adjustable table assembly comprising:
a base plate;
a movable table above said plate;
a plurality of angularly spaced columns mounted on said base plate, said table having respective surfaces disposed horizontally opposite said columns;
a plurality of plate springs which are annular in section and are connected to said columns and to said surfaces of said table so as to have their generatrices perpendicular to said movable table and the broad surfaces of the plates of said springs facing generally horizontally; and
electromagnetic driving means for driving said movable table relative to said base plate, said electromagnetic driving means being composed of a plurality of electromagnets at least one of which comprises an E-shaped magnetic core and at least two coils so as to minutely displace said movable plate in any direction in the same horizontal plane.

3,935,487

PERMANENT MAGNET MOTOR

Leonard C. Czerniak, 2459 Eastgate Road, Toledo, Ohio 43614

Filed May 6, 1974, Ser. No. 467,006
Int. Cl.² H02K 49/10
U.S. Cl. 310—46 11 Claims



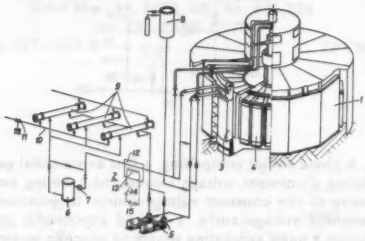
1. A permanent magnet motor comprising:
a supporting frame;
an output shaft rotatably attached to said frame;
a first permanent magnet means fixedly attached to said frame;
a second permanent magnet means in driving relationship with said shaft and rotatably attached to said frame for movement along a predetermined circular path whereby said permanent magnet means repel each other to generate movement in opposite directions along a first portion of said predetermined path; and
a magnetic shield coupled to said shaft and rotatably attached to said frame wherein said shield is driven between said first and second permanent magnet means when said first and second permanent magnet means are substantially adjacent each other along a second portion of said predetermined path.

3,935,488

METHOD OF OPERATING A FLUID-COOLED HYDROPOWER GENERATOR

Franz Spirk, and Werner Leistner, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 21, 1974, Ser. No. 516,508
Claims priority, application Germany, Oct. 30, 1973, 2354690
Int. Cl.² H02K 9/00
U.S. Cl. 310—53 2 Claims



1. A method of operating a fluid-cooled hydropower generator of a hydroelectric facility such as a pump storage plant, the generator being alternately in the active and shutdown condition as required and being equipped with: a circulation system for conducting fluid coolant for cooling the generator, the circulation system including control means for controlling system leaks and the conductivity of the fluid coolant; a heat exchanger connected into the circulation system for cooling the fluid coolant, the heat exchanger, in turn, having its own circulation system for fluid cooling the same; and, a pump for pumping the fluid coolant of the circulation system through the heat exchanger and the circulation system, the method comprising the steps of: maintaining the operation of said pump and said control means when the hydropower generator is in the shut-down condition to pump the fluid coolant through said circulation system and said heat exchanger; and, interrupting the circulation system for fluid cooling said heat exchanger when the hydropower generator is in the shut-down condition.

3,935,489

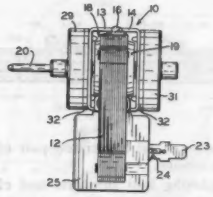
DYNAMOELECTRIC MACHINE HAVING IMPROVED VIBRATION ISOLATION AND THRUST SYSTEM

Ralph E. Church, Fort Wayne, Ind., and Daniel L. Beckman, Jonesboro, Ark., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 24, 1974, Ser. No. 463,560
Int. Cl.² H02K 5/16
U.S. Cl. 310—90 4 Claims

1. In an electric motor having a stator, a shaft having a rotor fixed thereto, a frame member carrying at least one bearing

for supporting the rotor shaft for rotation about the longitudinal axis of the shaft movement relative to the stator, and a cover carried by the frame member for establishing at least one boundary of a lubricant reservoir, the improvement comprising: said cover having a centrally disposed first interior surface region spaced a first predetermined distance from the frame, and further having secondary surface means located about the centrally disposed interior surface region with the secondary surface means being axially displaced, relative to the first interior surface region, in a direction toward the end



frame; said shaft having an end disposed within the lubricant reservoir and spaced from the first interior surface region; and the improvement further comprising a flexible thrust plate having at least a portion thereof spanning the first interior surface region to provide a flexible abutment for the shaft end disposed within the lubricant reservoir said portion being spaced from the first interior surface region and said portion establishing an unsupported span that is flexibly deflectable toward the first interior surface region in response to axially directed thrust loads applied thereto by the end of the rotor shaft.

3,935,490

SUPPORTING ARRANGEMENT FOR THE ROTOR OF A VERTICAL ELECTRIC MACHINE SUCH AS HYDRAULIC GENERATOR OR THE LIKE

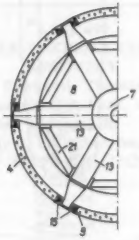
Franz Spirk, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 10, 1975, Ser. No. 539,956

Claims priority, application Germany, Mar. 1, 1974, 2410437

Int. Cl.[3] H02K *5/24*

U.S. Cl. 310—91 **7 Claims**



1. A supporting arrangement for the rotor of a vertical electric machine such as a hydraulic generator or the like comprising: at least one support spider equipped with a guide bearing for radially guiding the rotor and having a plurality of arms extending therefrom; a concrete support structure arranged in surrounding relation to the rotor; metal elements set into said concrete structure so as to define a plurality of cavities for receiving corresponding ones of said arms therein; and, adjustably pretensioned roller bearing means arranged at said cavities for holding said arms only in a tangential direction viewed relative to the stator of the electric machine.

3,935,491

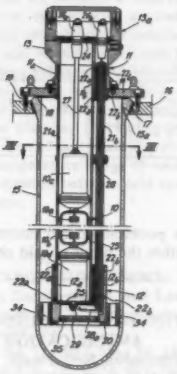
DISCHARGE LAMP

André Albert Hugot, Hauts-de-Seine, France, assignor to Compagnie Electro Mecanique, Paris, France

Continuation-in-part of Ser. No. 400,149, Sept. 24, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,527

Int. Cl.[3] H01J *61/52*

U.S. Cl. 313—25 **5 Claims**



1. An elongated discharge lamp comprising:
a. an elongated discharge tube including first and second electrodes at its respective first and second ends;
b. first and second end mountings supporting said discharge tube at said first and second ends thereof respectively;
c. an elongated conductor extending between said first and second end mountings;
d. first and second current supply terminals disposed at said first end mounting, said first current supply terminal being electrically connected with said first electrode and said second current supply terminal being electrically connected with said second electrode via said elongated conductor;
e. first and second tubular envelopes extending between and sealed at their ends to said first and second end mountings and surrounding said discharge tube and said elongated conductor respectively, at least said first envelope being of transparent material; and
f. a fluid-cooling jacket surrounding said first and second tubular envelopes.

3,935,492

IONIZATION SMOKE DETECTOR

Koju Sasaki, Tokyo, and Akihiro Kobayashi, Fujisawa, both of Japan, assignors to Nittan Company, Ltd., Tokyo, Japan

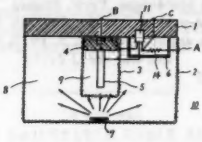
Continuation of Ser. No. 89,417, Nov. 13, 1970, abandoned. This application May 3, 1973, Ser. No. 357,071

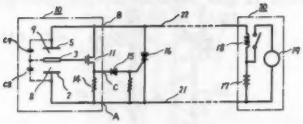
Int. Cl. H01J *17/32*

U.S. Cl. 313—54 **4 Claims**

1. An ionization smoke detector comprising an inner electrode, means including an air permeable intermediate electrode enclosing said inner electrode, means including an air permeable outer electrode enclosing said inner and intermediate electrodes, said intermediate electrode defining an inner chamber which includes said inner electrode and said intermediate and outer electrodes defining an outer chamber of substantially greater volume than said inner chamber and a radio-

active source disposed within one of said chambers to ionize the gas within the last said chamber, the radioactive emission





from said source penetrating said intermediate electrode to ionize the gas within the other of said chambers.

3,935,493

RADIATION DETECTOR USING DOUBLE AMPLIFICATION

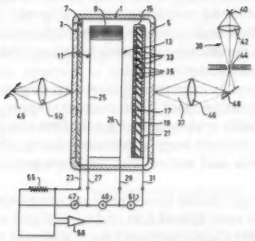
Geert Brouwer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,243

Claims priority, application Netherlands, June 28, 1973, 7309000

Int. Cl.² H01J *39/06*

U.S. Cl. 313—96 **6 Claims**



1. A radiation detector comprising:

a. an input photocathode;

b. an electron-optic amplifying member facing said input photocathode and comprising a channel amplifier plate structure capable of being used in two directions; and

c. a target structure comprising a second photocathode of relatively low lateral electric conductivity that faces said amplifier plate, a transparent electrically conductive layer, and a dielectric layer disposed between said second photocathode and said transparent layer.

3,935,494

SINGLE SUBSTRATE PLASMA DISCHARGE CELL

George Wilmer Dick, Colts Neck, and Walter Bryan Hatfield, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 21, 1974, Ser. No. 444,380

Int. Cl.² H01J *61/067*, *61/10*, *61/30*

U.S. Cl. 313—190 **3 Claims**

1. A gas discharge panel comprising

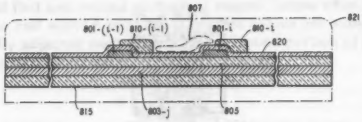
a substantially planar dielectric substrate,

a first plurality of spaced electrodes positioned on said substrate,

a first dielectric layer covering said first plurality of electrodes,

a second plurality of spaced electrodes positioned on said first dielectric layer and overlaying at least some of said first plurality of electrodes,

a first plurality of dielectric barriers overlaying said first dielectric layer each of said barriers being positioned at



least partly between an associated pair of said second plurality of electrodes,

an envelope enclosing said substrate and electrodes and barriers on said substrate, said envelope being substantially transparent in an area above said second set of electrodes, said envelope also containing a confined ionizable atmosphere, and

a dielectric layer covering said second plurality of electrodes, thereby shielding said second plurality of electrodes from said ionizable atmosphere.

3,935,495

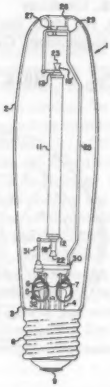
CHEMICALLY POLISHED POLYCRYSTALLINE ALUMINA MATERIAL

Garland E. Scott, Jr., Willoughby, and Michael K. Levenson, Cleveland Hts., both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,962

Int. Cl.² H01J *17/16*

U.S. Cl. 313—220 **6 Claims**



1. An improved high intensity electric discharge lamp comprising a light transmissive envelope having electrodes sealed into its ends and containing an ionizable medium for carrying the discharge, wherein the improvement comprises utilizing as the light transmissive envelope a tube consisting essentially of high density, polycrystalline alumina having the major exterior surfaces flux polished so as to reduce the high spots on the individual exterior alumina crystals without materially etching grain boundaries and thereby to obtain increased optical transmission upon flux removal.

3,935,496

STRUCTURE FOR ATTACHING CONICAL SHIELD TO SHADOW MASK

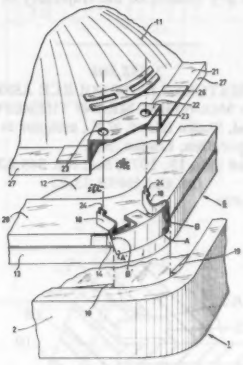
Johannes Henricus Nicolaas Gijrath, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,586

Claims priority, application Netherlands, Nov. 30, 1973, 7316388

Int. Cl.² H01J 29/07, 31/20

U.S. Cl. 313—402 5 Claims



1. A color cathode-ray tube comprising: an evacuated envelope and, within said envelope, means to generate at least two electron beams; a color selection electrode including an apertured mask and a screening diaphragm having an opening above a central part of said mask and a side wall attached to the edge of the mask, said mask and said diaphragm being made, respectively, of a thin sheet metal; supporting means comprising a plurality of suspension members connected to said electrode and each having a projecting end portion, and a plurality of resilient clamping members connected, respectively, to the projecting end portions to provide a detachable clamping connection with a matching inner portion of said envelope; and a screening cone of ferromagnetic sheet metal for shielding the electron beams from magnetic fields, said cone being secured to said clamping members and spaced from said electrode.

3,935,497

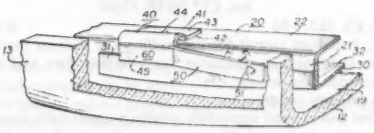
SHADOW MASK THERMAL COMPENSATING ASSEMBLY

Richard H. Cowles, Elmhurst; Thomas P. De Franco, Norridge, and Roy Maskell, Oak Park, all of Ill., assignors to Admiral Corporation, Chicago, Ill.

Filed July 5, 1968, Ser. No. 742,651

Int. Cl.² H01J 29/07, 31/20, 29/02

U.S. Cl. 313—405 6 Claims



1. A color television tube comprising: a glass panel having a discrete pattern of color phosphor elements thereon; a plurality of mounting studs disposed about the interior of said panel; an aperture mask having a radial axis of symmetry passing through a central portion thereof, said central portion being aligned in a predetermined position with respect to the phosphor pattern; a relatively rigid frame comprising a base flange and edge flange supporting said mask, said frame having a number of locating characters defining a plurality of first locating holes on said base flange, said first locating holes being accurately positioned with respect to said mounting studs; a corresponding plurality of spring members circumferentially disposed about said frame, cooperating with said mounting studs, for releasably maintaining said aperture mask in registry with said phosphor elements; and a plurality of substantially L-shaped thermal expansion members, each having a first leg secured to a respective one of said spring members, and a second leg secured to said frame and having a second locating hole respectively aligned with said first locating holes, whereby said expansion members may be accurately positioned on said base flange of said frame; said thermal expansion members comprising a bimetallic body with a first layer having a relatively high coefficient of thermal expansion and a second layer having a relatively low coefficient of thermal expansion whereby said expansion members undergo corrective flexures as said mask expands and contracts over the operating temperature range of said picture tube to maintain proper registration between said aperture mask and said phosphor elements.

3,935,498

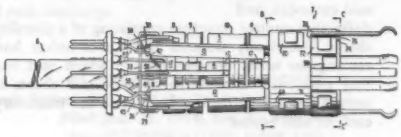
ELECTRON GUN ASSEMBLY

Frederick F. Doggett, East Syracuse, and Leonard W. Jenne, Jr., Baldwinsville, both of N.Y., assignors to General Electric Company, Portsmouth, Va.

Continuation of Ser. No. 731,807, May 24, 1968, abandoned. This application Feb. 14, 1973, Ser. No. 332,338

Int. Cl. H01J 29/02, 29/50

U.S. Cl. 313—417 7 Claims



1. In combination with three electron guns disposed such that the axes of said guns lie in the same plane:

I. four support rods positioned around said guns in a spaced relationship;

II. mounting strap means for connecting the center one of said three guns to all four of said support rods, and each of the outer two of said three guns to only two of said four support rods, said mounting strap means comprising

a. a first mounting strap arrangement rigidly attached to the center gun on one side of said plane and having corresponding ends secured to a first pair of said support rods located on the same side of said plane;

b. a second mounting strap arrangement rigidly attached to the center gun on the opposite side of said plane from the first strap arrangement and having corresponding ends secured to a second pair of said support rods located on said opposite side of said plane;

c. a third mounting strap arrangement rigidly attached to one of the two outer guns and having an end thereof located on the one side of said plane and secured to one of the rods from said first pair and another end thereof located on the other side of said plane and secured to one of the rods of said second pair; and

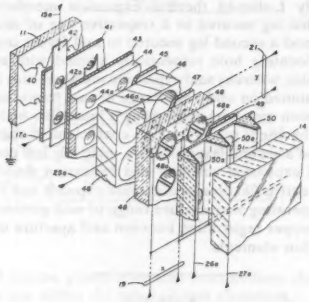
d. a fourth mounting strap arrangement rigidly attached to the other one of the two outer guns and having an end thereof located on the one side of said plane and secured to the other rod of said first pair and another end thereof located on the other side of said plane and secured to the other rod of said second pair.

3,935,499

MONOLYTHIC STAGGERED MESH DEFLECTION SYSTEMS FOR USE IN FLAT MATRIX CRT'S

Frederick G. Oess, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1975, Ser. No. 538,489
Int. Cl.² H01J *29/50, 31/00*
U.S. Cl. 313—413 **18 Claims**



1. In a flat cathode ray tube device for display of information by response to an electron beam of a phosphor coating on a face plate, the combination which comprises:

a monolythic system structure including

a. an x–y matrix of electron source cathodes,

b. a pair of grid arrays successively spaced from said matrix with holes therethrough adjacent to and aligned with said cathodes selectively to form and individually control the intensity of an electron beam from each of said cathodes, and

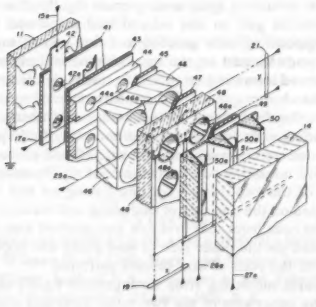
c. deflection control structure consisting of a plurality of sheets electrically isolated from each other having rectangular holes therein through which said beams may pass, with alternative ones of said sheets connected for *x*–*y* deflection control of the trajectory of each of said beams.

3,935,500

FLAT CRT SYSTEM

Frederick G. Oess, and Michael Peshock, Jr., both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1974, Ser. No. 530,624
Int. Cl.² H01J *63/04, 21/10*
U.S. Cl. 313—495 **19 Claims**



1. In a flat cathode ray tube device for display of information by response to an electron beam of a phosphor coating on a face plate, the combination which comprises:

a monolithic structure including

a. an x-y matrix of electron source cathodes,

b. a pair of grid arrays successively spaced from said matrix with holes therethrough adjacent to and aligned with said cathodes selectively to from and individually control the intensity of an electron beam from each of said cathodes, and

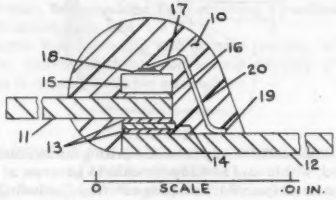
c. deflection control structure having holes through which said beams may pass with a set of *x*–*y* deflection electrodes associated with each of said holes for independent *x*–*y* control of the trajectory of each of said beams.

3,935,501

MICRO-MINIATURE LIGHT SOURCE ASSEMBLAGE AND MOUNTING MEANS THEREFOR

Silvester Sterbal, Staten Island, N.Y., assignor to Digital Components Corporation, Linden, N.J.

Filed Feb. 13, 1975, Ser. No. 549,828
Int. Cl.² H05B *33/02*
U.S. Cl. 313—499 **12 Claims**



1. A micro-miniature electrical assemblage comprising a pair of wire leads having overlapped ends, said ends, at the overlapped positions only thereof, being joined by bonding means providing both electrical insulation and physical strength, thereby forming a sub-assemblage having a central bonded juncture with the leads divergently projecting therefrom and freely deformable with respect thereto, a solid state electrical component having top and bottom contacts, said component being joined at the bottom thereof to one of said leads by electrically conductive bonding means, fine wire means electrically bonded to the top of said component and to the other of said leads, and said bonded juncture and associated solid state component being enveloped by a hardened mass of plastic material having electrical insulating properties.

3,935,502

BALLAST CIRCUIT FOR ELIMINATING FLICKER IN GASEOUS DISCHARGE LAMPS

Rollie R. Herzog, Danville, Ill., assignor to Construction Materials Division General Electric Company, Indianapolis, Ind.

Filed Apr. 6, 1973, Ser. No. 348,671
Int. Cl.² H05B *39/00*
U.S. Cl. 315—94 **8 Claims**

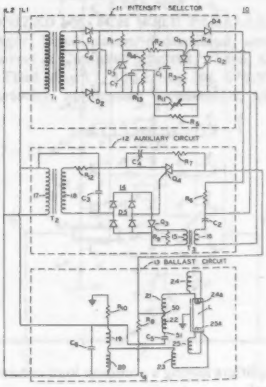
1. A ballast circuit for controlling the current through at least one gaseous discharge lamp having first and second electrodes comprising:

a primary winding;

first and second secondary windings electrically coupled to said primary winding, one end of each of said first and second secondary windings adapted to be coupled respectively to the first and second electrodes;

first and second heating windings for providing heating power to the first and second lamp electrodes respectively, said first and second heating windings respectively connected to one end of said first and one end of said second secondary windings, said one end of each of said

first and second secondary windings being free from a substantially direct connection to ground so that the first

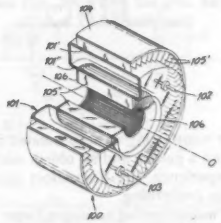


and second electrodes may vary substantially from ground potential.

3,935,503
PARTICLE ACCELERATOR

Thomas I. Ress, Buena Park, Calif., assignor to The Kreidl Chemico Physical K.G., Schaan, Liechtenstein

Filed Nov. 26, 1973, Ser. No. 418,858
Int. Cl.[3] H05H 1/12
U.S. Cl. 315—111.6 12 Claims

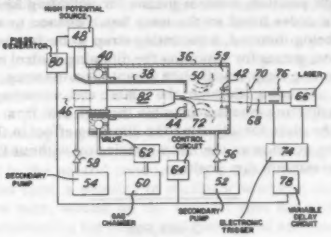


1. An accelerator for charged particles, comprising:
a vessel centered on an axis;
magnetostatic means producing a constant magnetic field in substantially axial direction;
excitation means for generating a rotating magnetic field in said vessel with a vector substantially perpendicular to said axis, said field revolving at constant speed about said axis; and
inlet means for admitting charged particles into said vessel for rotary entrainment along an annular path of predetermined radius by the combined action of both magnetic fields.

3,935,504
METHOD AND APPARATUS FOR INJECTION OF A PLASMA

Pierre Guillaneux, Chaville; Claude Patou, Le Perreux, and Gianfranco Tonon, Limeil-Brevannes, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Claims priority, application France, Aug. 19, 1970, 70.30425
Filed Aug. 16, 1971, Ser. No. 172,094
Int. Cl. H05h 1/04, 1/22
U.S. Cl. 315—111.7 11 Claims

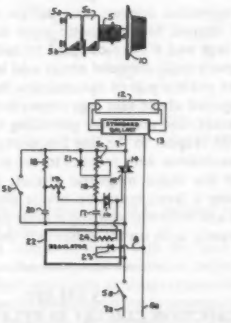


1. Plasma injection apparatus comprising a coaxial gun of the focus type comprising a hollow cylindrical outer electrode which surrounds a cylindrical inner electrode without contact and a window formed in said outer electrode, which forms a sealed enclosure, a solid target disposed on the axis of said gun and near the free end of the said inner electrode, means for injecting a gas into said enclosure, means for producing an electrical discharge between said two electrodes, a triggered laser producing a laser beam, an optical system for focusing the laser beam substantially on said target and means for synchronising the triggering of the light emission of said laser and said discharge.

3,935,505
FLUORESCENT LAMP DIMMER

Joseph Spiteri, 6613 E. Lake Road, Erie, Pa. 16511

Filed Jan. 21, 1974, Ser. No. 434,985
Int. Cl.[2] H05B 41/392; G05F 1/08
U.S. Cl. 315—194 4 Claims



1. A brightness control for a fluorescent lamp connected to a power supply, comprising: switch means connected between the power supply and the lamp, dimming control means connected between the switch means and the lamp, said dimming control means comprising electrode controlled semi-conductor switch means for blocking the flow of power to the lamp during each half cycle until gated on, capacitor means charged during each half cycle, gating means actuated in response to the charge on said capacitor means for gating said semi-conductor switch means to conduct, means for adjusting the charging rate of the capacitor means to advance or retard the

gating of said semi-conductor switch means and thereby decrease or increase the dimming, said dimming control means being adjustable in a range from minimum dim to maximum dim, said switch means for connecting said dimming control and said lamp in a plurality of circuit relationships, to-wit: an off position, an on position connecting the power supply to the lamp and bypassing the dimming control means, a minimum dim position opening the bypass around the dimming control and positions between said minimum dim position and a maximum dim position, control means for actuating said switch means in order listed so the lamp has a chance to warm up before being dimmed, a mounting strap to be fastened to an outlet box, means for mounting the dimming control means on the mounting strap, a wall plate mounted on the strap, a switch control extending through the plate, and trimming means having adjusting means accessible through and from the outside of the plate for adjusting the dimming effect in the maximum dim position so the lamp remains on without flickering in said maximum dim position.

3,935,506

DEVICE FOR RADIAL, STATIC AND DYNAMIC CONVERGENCE OF ELECTRON BEAMS IN A COLOUR TELEVISION DISPLAY TUBE

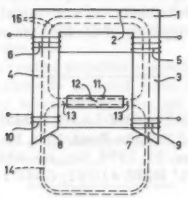
Hans-Jürgen Brockmann, Halstenbek, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1972, Ser. No. 231,548

Claims priority, application Germany, Mar. 13, 1971, 2112163

Int. Cl.² H01J *29/56*

U.S. Cl. 315—370 **7 Claims**



1. A television convergence device comprising a substantially U shaped ferromagnetic core have two substantially parallel legs and a yoke coupled to said legs; a pair of static convergence coils disposed about said legs respectively proximate said yoke; a pair of dynamic line frequency convergence coils disposed about said legs respectively proximate the free ends thereof; and means for providing a small magnetic resistance with respect to the line frequency magnetic circuit and a large resistance with respect to the internal magnetic resistance of the static magnetic circuit, said providing means comprising a ferro magnetic bridge disposed proximate said two legs and between said static coils on one side thereof and said dynamic coils on the other side thereof.

3,935,507

CORRECTION CIRCUIT IN TELEVISION DISPLAY APPARATUS USING DIFFERENTIAL AMPLIFIERS

Jörg Wölber, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

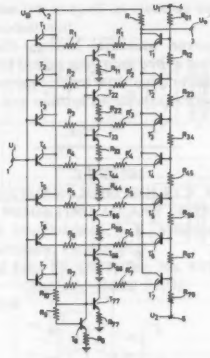
Filed Feb. 26, 1974, Ser. No. 445,908

Claims priority, application Germany, Mar. 8, 1973, 2311574

Int. Cl.² H01J *29/70*

U.S. Cl. 315—370 **8 Claims**

8. A circuit arrangement comprising means for receiving an input signal, a plurality of difference amplifiers each having a first and a second input terminal, all first input terminals being coupled together and to the means for receiving the input signal, the second input terminals comprising means for receiving respectively different biasses, an output terminal, the



difference amplifiers having a common load connected to said output terminal.

3,935,508

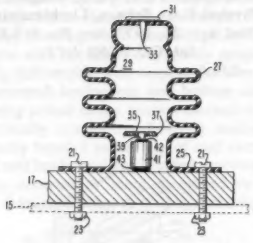
HIGH VOLTAGE DISCHARGE SWITCH FOR PROTECTING SENSITIVE ELECTRONIC EQUIPMENT AND THE OPERATORS THEREOF

Douglas E. Moister, Jr., Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 5, 1974, Ser. No. 494,978

Int. Cl.² A61N *1/14*; H05F *3/04*

U.S. Cl. 317—2 R **12 Claims**



1. A device for transferring an accumulated charge of static electricity between a person and an object such that the person does not experience any discomfort due to electrical shock, said device comprising:

upper contact means having an upper finger touch contact surface for receiving an accumulated charge of static electricity from said person;

lower contact means for effectively dissipating a transferred charge without causing any discomfort to said person;

flexible housing means for defining an air space and establishing an initial distance between said upper contact means and said lower contact means, said flexible housing means being responsive to the pressure exerted when said person touches said upper contact surface for variably reducing said distance; and

wherein said upper contact means further includes a sharp pointed means responsive to said established distance having been reduced to a first length for initiating a corona discharge to initially transfer at least a portion of said accumulated charge of static electricity, said sharp

pointed means being responsive to said established distance having been further reduced to a second length for directly transferring any remaining portion of said accumulated charge of static electricity to said lower contact means.

3,935,509

SYNCHRONIZED SWITCH WITH PARALLEL CONTACT

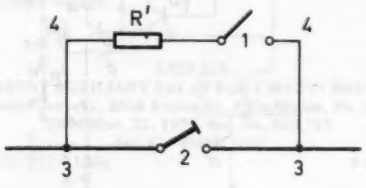
Adolf Eidinger, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 17, 1974, Ser. No. 470,990

Claims priority, application Switzerland, May 21, 1973, 7120/73

Int. Cl.² H02H 7/22

U.S. Cl. 317—11 A 1 Claim



1. A switching arrangement located in the vicinity of and connected to an alternating current generator for disconnecting the generator under load comprising a first switch connected to the generator for carrying the normal load current therefrom in a continuous manner, a second switch of the synchronized type connected in parallel with said first switch and which is arranged to open its contacts in a zero current interval following an opening operation of the contacts of said first switch, and an ohmic resistor connected in the current flow path through said second switch and whose resistance is at most a 0.2 fold and preferably a 0.1 fold value of the subtransient short-circuit impedance of said generator.

3,935,510

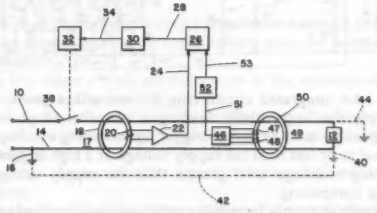
GROUND FAULT PROTECTIVE SYSTEM INCLUDING AN IMPEDANCE RESPONSIVE OSCILLATOR

Geoffrey Clarke, Blunsdon, near Swindon, England, assignor to Square D Company, Park Ridge, Ill.

Filed Feb. 25, 1974, Ser. No. 445,379

Int. Cl.² H02H 3/28

U.S. Cl. 317—18 D 1 Claim



1. In a ground fault current protective system for an electrical distribution circuit having at least one line conductor connecting a voltage source to a load and a neutral conductor grounded at the source at a ground terminal and providing a return path from the load to the source, said ground fault current protective system comprising a ground fault detecting means positioned on said distribution circuit and providing a ground fault output signal related in value to the magnitude of a ground fault current flowing to ground from the line conductor at any point between the ground fault detecting means and the load, an impedance detecting means positioned on said distribution circuit and providing an a.c. impedance output signal related in value to the impedance between ground and any point on the neutral conductor between the impedance detecting means and the load, a demodulator coupled to the impedance detecting means to convert the a.c. impedance output signal of the impedance detecting means to a d.c. voltage level related in value to the magnitude of the a.c. impedance output signal, and a level detecting means having a first input connected to the ground fault detecting means and having a second input connected to the demodulator with said level detecting means rendered operative to provide an output signal whenever the ground fault output signal reaches a predetermined value at said first input of the level detecting means and whenever the d.c. voltage level of the demodulator reaches a predetermined value at said second input of the level detecting means, the improvement wherein the impedance detecting means comprises an oscillator magnetically coupled to the neutral conductor by a transformer including a toroidal core, a plurality of oscillator windings, each of at least one turn, wound on the toroidal core for partially or totally attenuating the output oscillator signal whenever a low impedance occurs between ground and the neutral conductor on the load side of the protective system and for providing a positive feedback path for the oscillator, and another winding of at least one turn on the toroidal core connected in series with the neutral conductor.

3,935,511

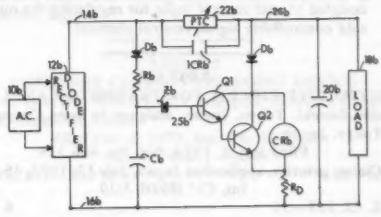
CURRENT INRUSH LIMITER

Henry J. Boulanger, Cumberland, R.I., and Theodore Brassard, Berkley, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 428,560

Int. Cl.² H02H 9/00

U.S. Cl. 317—20 9 Claims



1. A protective circuit connecting a D.C. voltage source of output voltage V to a load, comprising:

electrical resistance means in series with the load to limit start up current to the load, said resistance means having a relatively constant resistance at temperatures below an anomaly and a steeply-sloped positive temperature coefficient (PTC) of resistivity at temperatures above the anomaly,

voltage sensitive means in parallel with the load and having an output signal for shunting and resistance means out of the circuit,

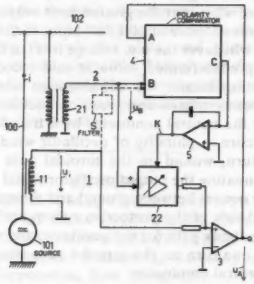
said voltage sensitive means so constructed as to provide said output signal only when the voltage sensed reaches a predetermined level somewhat less than V, and

a thermally responsive switching means in series with and located adjacent said resistance means, said switching means serving to break said circuit when the temperature of said resistance means exceeds a predetermined level.

3,935,512
CIRCUIT FOR THE COMPENSATION OF CURRENT INTERFERENCE SIGNALS

Jean-Pierre Falk, and Andre Rohr, both of Geneva, Switzerland, assignors to Societe Anonyme des Ateliers de Secheron, Geneva, Switzerland

Filed Dec. 11, 1974, Ser. No. 531,608
Claims priority, application Switzerland, Dec. 20, 1973, 17866/73
Int. Cl.² H02J 1/02
U.S. Cl. 317—27 R **10 Claims**



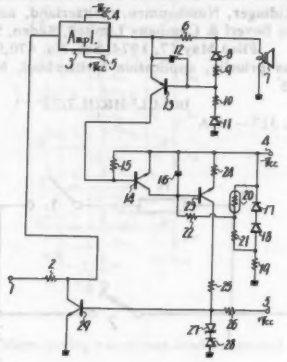
1. A circuit for the compensation of current interference signals in another circuit to which a voltage containing a disturbing component is applied comprising:
- a current-signal branch and a compensation branch,
- means for applying an interference signal to said compensation branch,
- a controllable signal control element coupled to said compensation branch and including a control input,
- superimposing means coupled to both said current-signal branch and said compensation branch for providing a superimposed output signal,
- a polarity comparator coupled to the output of said superimposing means, the output of said polarity comparator coupled to said control input for regulating the output of said controllable signal control element.

3,935,513
PROTECTIVE CIRCUIT FOR TRANSISTOR AMPLIFIER

Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 8, 1974, Ser. No. 486,319
Claims priority, application Japan, July 12, 1973, 48-78954
Int. Cl.² H02H 7/20
U.S. Cl. 317—31 **6 Claims**

1. A transistor amplifier protective circuit comprising:
- an input terminal supplying an input signal to said transistor amplifier,
- a first transistor with its emitter-collector electrodes connected between ground and said input terminal to short said input signal to ground when said first transistor conducts,
- a first resistor with one side connected to the output of said transistor amplifier, a load connected between ground and the other side of said first resistor,
- second and third transistors with the collectoremitter path of said second transistor connected between the output of said transistor amplifier and the control electrode of said third transistor,
- a first capacitor connected between the control electrode of said second transistor and the output of said transistor amplifier,
- a fourth transistor with its control electrode connected to the emitter-collector path of said third transistor,
- a bias voltage of a first polarity, and the emitter-collector path of said fourth transistor connected between the control electrode of said first transistor and said bias voltage of a first polarity,
- a second capacitor connected between said bias voltage of a first polarity and the control electrode of said fourth transistor,
- a second resistor connected between ground and the control electrode of said fourth transistor,

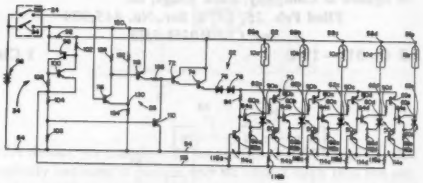


- a third resistor connected between the other side of said first resistor and the control electrode of said second transistor, and
- a fourth resistor connected between ground and the control electrode of said second transistor.

3,935,514
FLASH LAMP SIGNALING CIRCUIT EMPLOYING LOGIC SIGNAL ACTIVATION

Seymour Ellin, Brookline, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 321,993, Jan. 8, 1973, abandoned. This application Apr. 20, 1973, Ser. No. 353,007
Int. Cl.² F21K 5/02
U.S. Cl. 317—80 **3 Claims**



1. An integrated circuit chip for use with a given voltage supply for sequentially flashing a plurality of photolamps responsive to either a low trigger signal having a voltage level equal to or less than the supply voltage or a high trigger signal having a voltage level greater than the supply voltage, said chip comprising:
- a pair of supply terminals configured for electrical coupling to the voltage supply so as to energize said chip;
- a lamp firing circuit coupled to said supply terminals and configured for sequentially firing each of a plurality of photolamps in a predetermined order responsive to repetitive application of a given input signal, said lamp firing circuit including a plurality of lamp switching circuits coupled to said supply terminals in a predetermined order of first to last with each of said switching circuits being configured for electrical coupling to one of the photolamps, and a forward sequencing circuit coupled to each

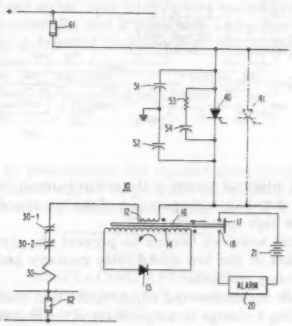
of said lamp switching circuits, said sequencing circuit being configured for actuating the next in order of said switching circuits having an operable photolamp responsive to said given input signal;

a plurality of trigger circuit elements configured for connection in a first or second trigger circuit configuration to said forward sequencing circuit for respectively providing said input signal responsive to application of the high and low trigger signals, said trigger circuit elements including a voltage detector configured for connection with a first group of said elements in said first trigger circuit configuration to provide said input signal responsive to application of a trigger signal exceeding the supply voltage, and a transistor independent of said first group of elements configured for connection in said second trigger circuit configuration to provide said input signal responsive to application of a trigger signal equal to or less than the supply voltage.

3,935,515
CURRENT AUXILIARY RELAY FOR CIRCUIT BREAKER

Lubomyr Janycky, 2508 Brown St., Philadelphia, Pa. 19130

Filed Mar. 21, 1975, Ser. No. 560,787
Int. Cl.² H02H *3/04*
U.S. Cl. 317—155 **8 Claims**



1. In a circuit breaker control installation having a trip coil and trip contacts and a current auxiliary relay for actuating a trip alarm:

a. a trip alarm circuit normally open at the contacts of said current auxiliary relay;

b. an armature in said current auxiliary relay for connecting said contacts to close said trip alarm circuit to actuate said alarm;

c. a core of magnetizable material connected to said armature;

d. a shunt coil having a large number of turns wound on said core;

e. a diode in series with said shunt coil, said diode being poled to pass current in a direction to develop a magnetizing force tending to pull said core in a direction to move said armature in a contact-closing direction;

f. a series coil having but relatively a few turns wound over but insulated from said shunt coil and in close coupling therewith;

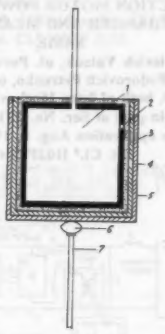
g. said series coil being in series circuit with the trip coil;

h. said series circuit including solid state tripping contacts.

3,935,516
CAPACITOR WITH GLASS METAL CONDUCTIVE LAYER

Klaus Rudiger Petrikat, Buchenweg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,537
Claims priority, application Germany, Apr. 14, 1973, 2319052
Int. Cl.² H01G *9/00*
U.S. Cl. 317—230 **4 Claims**

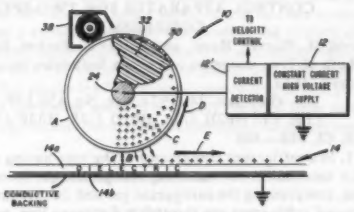


1. A capacitor comprising a porous inner electrode body, a first lead-in wire embedded in said body, a dielectric metal-oxide film of the metal of said inner electrode over said body, a manganese dioxide electrode layer over said dielectric metal-oxide film, a conductive layer of graphite over said manganese dioxide layer, an outer conductive layer of a solderable mixture of powdered glass and a metal powder resistant to oxidation and which solidifies at a temperature of about 600°K, a second wire lead, and a layer of solder metal disposed on said glass-metal layer within a limited contact area, said solder layer connecting said second wire lead to said conductive layer.

3,935,517
CONSTANT CURRENT CHARGING DEVICE

John F. O'Brien, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1975, Ser. No. 538,118
Int. Cl.² H01T *19/00*
U.S. Cl. 317—262 A **12 Claims**



1. Apparatus for depositing a constant density surface charge on a moving dielectric medium, comprising:

a charging roller mounted adjacent to and spaced from said dielectric medium to define an ionizable air gap between the surface of said charging roller and said dielectric medium, said charging roller comprising an electrically relaxable insulator having a thickness which is greater than the thickness of said dielectric medium;

means for moving the surface of said charging roller in the same direction as, independently of, and relative to said dielectric medium; and

variable electrical bias means coupled to said charging roller for generating an electric field in said air gap to charge said dielectric medium with a substantially constant density surface charge.

3,935,518

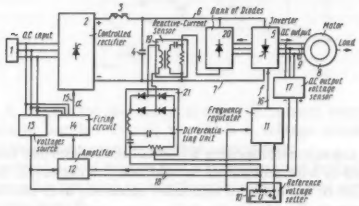
METHOD OF ELIMINATING SELF OSCILLATIONS OF AN INDUCTION MOTOR POWERED FROM A FREQUENCY CHANGER AND MEANS FOR EFFECTING SAME

Vladimir Grigorievich Yatsuk, ul. Pervomaiskaya, 8, kv. 57, and Vladimir Fedorovich Petrenko, ul. Sovetskaya, 13, korpus 1, kv. 210, both of Istra Moskovskoi oblasti, U.S.S.R.

Continuation-in-part of Ser. No. 221,740, Dec. 6, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,910

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **4 Claims**



1. A method of eliminating self-oscillations of an induction motor powered from a thyristor frequency changer, in order to control the output voltage and the output frequency of the motor by respective first and second means, the method consisting in applying an additional correcting signal from the frequency changer to said first means, as a positive feedback, said additional signal being proportional to a first derivative of the low-frequency component of the reactive current oscillations of the motor, in sequence with a main control signal applied thereto, the maximum value of changes in the output frequency from said additional signal being limited to a level that is proportional to the nominal frequency of the rotor current of the motor.

3,935,519

CONTROL APPARATUS FOR TWO-SPEED COMPRESSOR

David M. Pfarrer, Hurst, and Sidney A. Parker, Fort Worth, both of Tex., assignors to Lennox Industries Inc., Marshalltown, Iowa

Filed Jan. 24, 1974, Ser. No. 436,179

Int. Cl.² H02H *5/04;* **H02D** *1/28;* **H02P** *1/38*

U.S. Cl. 318—305 **4 Claims**

1. In a refrigerant compressor of the type having a compression mechanism for receiving refrigerant gas from a suction line, compressing the refrigerant gas and discharging the compressed refrigerant gas through a discharge line, and a motor for rotating drive shaft means in the compression mechanism at low speed and at high speed, said motor including a single stator coil assembly comprising first, second and third stator coils, each stator coil having an inner end point connected to a common conductor and also having an outer end point, improved apparatus for controlling the operation of the motor from a source of electrical power comprising:

a fourth stator coil having a first end point connected to the outer end point of the first stator coil;

a fifth stator coil having a first end point connected to the outer end of the second stator coil;

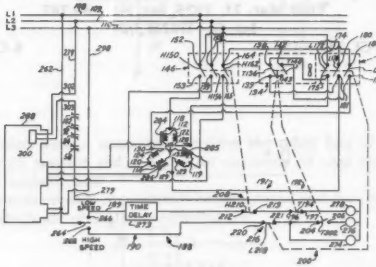
a sixth stator coil having a first end point connected to the outer end point of the third stator coil;

a tying relay coil for operating tying relay contacts that switch the stator coils between a high speed interconnection and a low speed interconnection;

a low speed relay coil for operating low speed relay contacts that apply power from the source to the stator coils after the stator coils have been switched to the low speed interconnection to achieve low speed operation so that damaging surge voltages and currents in the stator coils are prevented;

a high speed relay coil for operating high speed contacts that apply power from the source to the stator coils after the stator coils have been switched to the high speed interconnection to achieve high speed operation so that damaging surge voltages and currents in the stator coils are prevented;

a control circuit including a first branch for controlling the high speed relay coil and a second branch for controlling the low speed relay coil;



electrical interlock means in the control circuit for preventing the simultaneous operation of the low speed relay coil and the high speed relay coil;

mechanical interlock means to prevent the simultaneous operation of the low speed relay contacts and the high speed relay contacts;

first sensor means located adjacent the first stator coil for indicating a change in temperature of the first stator coil;

second sensor means located adjacent the second stator coil for indicating a change in temperature of the second stator coil;

third sensor means located adjacent the third stator coil for indicating a change in temperature of the third stator coil; and

control means for interrupting the flow of current in the first and second branches in response to an indication from any of said sensors that the temperature of any of said stator coils exceeds a predetermined value, so that the control circuit is prevented from operating the tying relay coil, low speed relay coil, or high speed relay coil.

3,935,520

DC MOTOR REGULATOR

Chandler A. Johnson, III, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed July 24, 1974, Ser. No. 491,604

Int. Cl.² H02P *5/16*

U.S. Cl. 318—332 **8 Claims**

1. A regulator for a direct current motor, energized from a controllable power supply, responsive to motor current and motor speed feedback signals comprising:

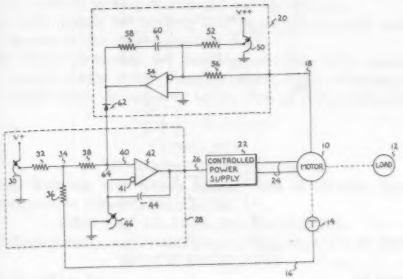
a. a current limit circuit including,

1. means to provide a current reference signal proportional to a desired maximum motor current,

2. means to compare said current reference signal with the motor current feedback signal to provide, when the latter exceeds the former, a current limit signal;

b. a speed control circuit for providing a control signal to said power supply including,

1. means to provide a speed reference signal proportional to a desired motor speed,



2. means to compare said speed reference signal with the speed feedback signal to provide said control signal to control said power source in the absence of said current limit signal, said latter means including a resistive component (R) and a capacitive component (C) and having a transfer characteristic (G) defined by the equation

$$G = \frac{1+R\cdot C\cdot j\omega}{R\cdot C\cdot j\omega};$$

and,

c. means to interconnect the current limit circuit and the speed control circuit to produce the control signal as a function of said current limit signal when it is present.

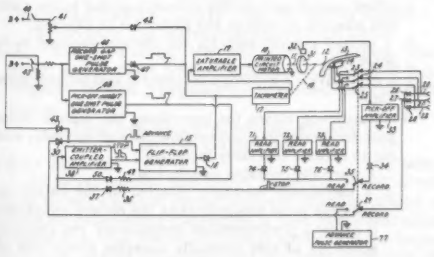
3,935,521
DISPLACING APPARATUS

Robert P. Burr, Huntington, N.Y., assignor to Kollmorgen Corporation, Glen Cove, N.Y.

Division of Ser. No. 536,541, March 4, 1966, Pat. No. 3,614,757, which is a continuation of Ser. No. 321,511, Nov. 5, 1963, abandoned, which is a continuation-in-part of Ser. No. 120,256, June 28, 1961, Pat. No. 3,182,243. This application Dec. 29, 1970, Ser. No. 102,419. The portion of the term of this patent subsequent to Oct. 19, 1988, has been disclaimed.

Int. Cl.[2] H02P *1/04*

U.S. Cl. 318—394 **2 Claims**



1. An incremental drive system for a web member comprising a drive capstan in non-sliding engagement with the web member, direct current motor means coupled to the capstan, and electrical energizing means including saturable amplifier means coupled to the motor means for applying an energizing signal for a predetermined interval, the energizing signal providing successive controlled acceleration and deceleration of the motor means.

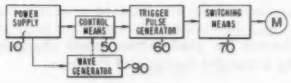
3,935,522
CONTROL DEVICE FOR THE ELECTRIC FAN

Peter Wen-Tien Tsay, No. 3, Hsin-Sheng South Road Section 1, Taipei, China /Taiwan

Filed Jan. 8, 1974, Ser. No. 431,765

Int. Cl.[2] H07P *5/16*

U.S. Cl. 318—345 **27 Claims**



1. A motor speed control circuit for an electric fan motor to control the speed of operation of the fan motor, said circuit comprising:

a. a power supply means;

b. speed control circuit means connected with said power supply means, said speed control circuit means comprising a control means and a delay speed reduction means which includes a charge-discharge circuit, a large capacitor, and a first switch means which is connected between said power supply means and said charge-discharge circuit;

c. trigger pulse generator means connected with said speed control circuit means and with said power supply means, whereby pulses generated by said trigger pulse generator means are controlled through said speed control circuit means to accomplish variable speed control of said fan motor; d. and output switch means connected with said trigger pulse generator means and with said fan motor, which is in turn connected to an AC source, to receive trigger pulses from said trigger pulse generator means and to supply power to said fan motor, whereby when said first switch means is on, said large capacitor is quickly charged to enable said charge-discharge circuit to charge up to the full range of output signal so that said fan motor performs a normal operation and through the control of said control means the speed control of said normal operation of said fan motor is thus obtained, and when said first switch means is off, said large capacitor is discharged and said fan motor speed is gradually reduced from said normal operation speed to a predetermined relatively low speed.

3,935,523
NON-MINIMUM PHASE LINEAR CONTROLLER FOR HYDRAULIC MECHANISMS

Dixon Cleveland, Annandale, and Milford R. Derrick, Falls Church, both of Va., assignors to Adaptronics, Inc., McLean, Va.

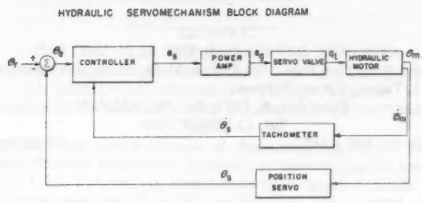
Continuation of Ser. No. 312,267, Dec. 5, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,901

Int. Cl.[3] G05B *11/00*

U.S. Cl. 318—609 **4 Claims**

1. A control system employing positive rate feedback for

controlling a plant where the positive feedback is indicated by a right half plane zero of the S-plane in a root-locus system



analysis, wherein the predominant plant characteristics are described by a transfer function of the form

$$\frac{K}{s(s^2 + 2\delta\omega_n s + \omega_n^2)}$$

where K, δ, and ω_n are either constant or vary only a small amount around nominal values, and where s is the Laplace operator, comprising

a. means responsive to command plant response minus measured plant response to provide a plant error signal,
b. means for providing a plant rate response signal, and
c. control means for controlling said plant, said control means comprising:
d. means responsive to said plant error signal to provide a signal indicative thereof multiplied by a positive constant, K_e,
e. means responsive to said plant rate response signal to provide a signal indicative thereof multiplied by a positive constant, T_ϕ and
f. means for summing the signal provided in (d) plus the signal provided in (e) to provide a control signal for said plant said plus defining a zero in the right half portion of the S-plane when analyzing the system by the root-locus method, when the values of the constants K_e and T_ϕ are chosen such that none of the system poles are in the right half plane when analyzing the system by the root-locus method.

3,935,524
CIRCUIT ARRANGEMENT FOR DETECTING VOLTAGE DIFFERENCES

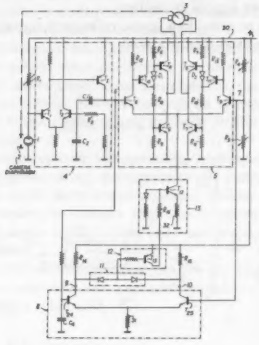
Heinrich Cap, Vienna; Herbert Krammer, Hinterbruhl, and Robert Scheiber, Vienna, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Division of Ser. No. 206,466, Dec. 9, 1971, Pat. No. 3,806,789.
This application Sept. 26, 1973, Ser. No. 401,112
Claims priority, application Austria, Dec. 15, 1970, 11286/70; Dec. 16, 1970, 11337/70; Dec. 17, 1970, 11397/70
Int. Cl.² G03B 7/10; G05B 1/06
U.S. Cl. 318—640 **16 Claims**

1. A circuit arrangement for detecting deviations of the setting of an adjustable camera diaphragm from a preselected value, comprising:

a differential amplifier provided with a first input connected to a source of reference voltage and with a second input connected to an output of a photoelectric transducer juxtaposed with the diaphragm for illumination therethrough, said differential amplifier further having rectifying output means generating an unbalance signal of predetermined polarity in the presence of a difference of either polarity between said reference voltage and an output voltage of said transducer;

a normally inactive comparison circuit connected across said first and second inputs and provided with an activating lead; and

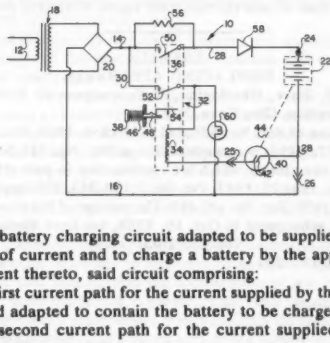


switching means connected between said output means and said activating lead for placing said comparison circuit in an operative condition in response to said unbalance signal.

3,935,525
BATTERY CHARGING CIRCUIT WITH THERMOSTAT CONTROL

Donald Edwin Elson, Timonium, and Richard Thomas Walter, Baltimore, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 30, 1974, Ser. No. 510,391
Int. Cl.² H02J 7/00
U.S. Cl. 320—35 **13 Claims**



1. A battery charging circuit adapted to be supplied with a source of current and to charge a battery by the application of current thereto, said circuit comprising:

a. a first current path for the current supplied by the source and adapted to contain the battery to be charged;
b. a second current path for the current supplied by the source;
c. a relay having a winding connected in said second current path;
d. coincidence means for completing the second current path and permitting current flow through said relay winding to actuate said relay including:
   1. a manually operable switch, and
   2. a thermostat thermally coupled to the battery and designed to be actuated when the battery temperature is below a predetermined temperature, the coincident actuation of said manually operable switch and said thermostat causing the completion of the second current path;
e. means responsive to the actuation of said relay for permitting current flow through said first current path to said battery; and

f. holding means for retaining said manually operable switch in the closed position after manual operation thereof until said thermostat actuates.

13. A battery charging circuit adapted to be supplied from a source of current and for charging a battery by the application of current thereto, said circuit comprising:

a. thermostat means thermally coupled to said battery for controlling the flow of current thereto;

b. manually operable switch means for controlling the flow of current to said thermostat and the battery;

c. latch means for holding said manually operable switch means in the closed position; and

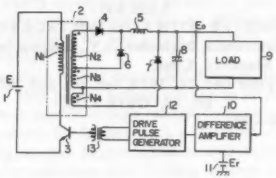
d. electrical means for holding said manually operable switch means in the closed position while releasing said latch means in response to the flow of current therein.

3,935,526

DC-TO-DC CONVERTER

Yasuji Kamata, and Kazuo Katou, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 14, 1973, Ser. No. 388,260
Claims priority, application Japan, Aug. 14, 1972, 47-80757
Int. Cl.² H02M 3/335
U.S. Cl. 321—2 **11 Claims**



1. A DC-to-DC converter to provide a DC output voltage proportional to the DC voltage applied to the primary winding of a transformer by turning on and off said DC voltage by means of a switching element connected in series with said primary winding, and rectifying and smoothing the voltage developed across the secondary winding of said transformer upon the turning on and off of said DC voltage by means of a circuit including a rectifying diode, a choke coil and a capacitor, said transformer having a core exhibiting a rectangular hysteresis characteristic, wherein said converter includes reset means for causing, at the time of turning off of said switching element, the current flowing through said choke coil at the time of turning on of said switching element to flow as a reset current through a part of said secondary winding of said transformer so that the level of the magnetic flux of said core of said transformer may be restored to its initial value.

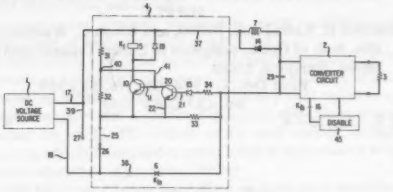
3,935,527

INRUSH CURRENT LIMIT CIRCUIT WITH RESET RESPONSE TO LOWERED INPUT VOLTAGE

Robert Wilson Michelet, Madison; Roman Ostapiak, Pine Brook, and Rudolph Scuderi, Mountain Lakes, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 14, 1974, Ser. No. 497,182
Int. Cl.² H02M 1/18
U.S. Cl. 321—11 **4 Claims**

1. An inrush current limit circuit comprising, input terminals to accept a source, output terminals to accept a load, a current limit impedance connecting at least one of said input terminals to at least one of said output terminals, a low impedance path, means to connect said low impedance path in parallel with said current limit impedance, means to operate said means to connect, current sensing means connected to sense the current in said current limit impedance, voltage monitoring means connected to monitor the voltage at said input terminals, said means to operate responsive to said current sensing means at a current below a particular low current threshold to connect said low impedance path in parallel with said current limiting impedance, said means to



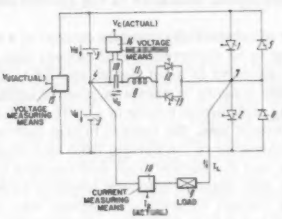
operate being further responsive to said voltage monitoring means at a voltage below a particular low voltage threshold to disable said means to connect and disconnect said low impedance path from a parallel connection with said current limiting impedance.

3,935,528

SELF-COMMUTATING INVERTER MEANS

Jörg Brenneisen, Mannheim, and Arnold Schönung, Lindenberg, Pfalz, both of Germany, assignors to Brown, Boveri & Cie, A.G., Mannheim, Germany

Filed Mar. 15, 1974, Ser. No. 451,585
Int. Cl.² H02M 7/44
U.S. Cl. 321—45 C **1 Claim**



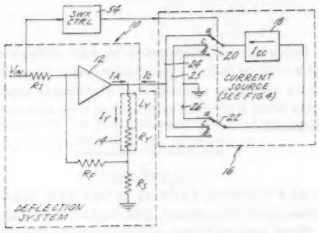
1. In a self-commutating inverter having a pair of main thyristors connected in series with each other and to a d-c source, commutating means comprising a capacitor energy storage means connected between a center tap on the d-c source and a pair of auxiliary thyristors connected anti-parallel to each other, the other ends of said pair of auxiliary thyristors being connected to a common point between said main thyristors, a load connected between the center tap of said d-c source and the connection of said two main thyristors, means to adjust the firing of the transistor in response to varying operating conditions comprising firing control means having outputs which are connected to the main and auxiliary thyristors to trigger said thyristors with firing pulses at presettable times whereby the auxiliary thyristor connected as the commutation valve with a main thyristor is triggered prior to the firing of the main thyristors by a presettable time interval, comprising a first voltage measuring device connected across the capacitor by means of which the actual-value signal of the capacitor voltage is determined, first comparison means connected to said first voltage measuring means to compare the actual-value signal to a reference signal, second and third comparison means for comparing reference and actual signals of the d-c supply voltage and the load current, and summing means connected to said comparison means for summing the difference between actual value-reference capacitor voltages, d-c source voltages and the load current, said firing control means being connected to said comparison means whereby the firing time intervals can be adjusted by said firing control

means, as a function of the difference between reference signals and the actual measured signals.

3,935,529
MODULATED ENERGY CONSERVATIVE CURRENT SUPPLY

Michael H. Kalmanash, Bethel, and Glenn C. Waehner, Riverside, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 9, 1974, Ser. No. 513,359
Int. Cl.² G05F 1/62
U.S. Cl. 323—4 **5 Claims**



1. An energy conservative current system comprising:

a current load and an amplifier driving said current load with negative feedback from said current load in response to input signals indicative of the current desired in said load;

a source of substantially constant current of a magnitude of current to be delivered to said current load; and

means responsive to input signals applied to said amplifier of either polarity in excess of given magnitude for connecting said current source in a corresponding polarity to said current load, the current in said current load being the summation of the current from said constant current source and the current from said negative feedback amplifier, said negative feedback amplifier being responsive to the current through said current load to provide a current equal to the difference between the current supplied by said constant current source and the current desired in said load as indicated by the amplifier input signals, said means also being responsive to the absence of input signals to said amplifier in excess of said given magnitude for disconnecting said current source from said amplifier.

3,935,530
COMPENSATION EQUIPMENT FOR FLUCTUATIONS IN A.C. SOURCE VOLTAGE

Masaru Tanaka; Yoshimitsu Matsumoto, both of Toyonaka, and Takeshi Oku, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 24, 1972, Ser. No. 256,408
Claims priority, application Japan, May 26, 1971, 46-36088; May 26, 1971, 46-42995[U]
Int. Cl.² G05F 1/44
U.S. Cl. 323—19 **4 Claims**

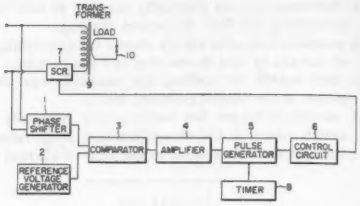
1. An AC voltage regulator for regulating voltage applied to a load from a source of an AC supply voltage, comprising

a phase shifter for advancing the phase of said supply voltage;

a reference voltage generator for generating a reference voltage for comparison with the output voltage of said phase shifter;

a comparator for comparing the instantaneous output voltage of said phase shifter with the reference voltage derived from said reference voltage generator; and

an SCR firing angle control circuit is connected in series to supply voltage from said source to said load in response to the output signals from said comparator;

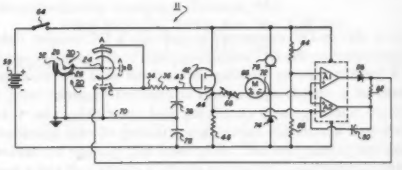


whereby the SCR firing angle may be controlled so as to maintain constant the effective load current regardless of said supply voltage.

3,935,531
ELECTROMETER WITH LOW VOLTAGE INDICATOR

Robert J. Slomcenski, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1974, Ser. No. 532,785
Int. Cl.² G01R 31/02
U.S. Cl. 324—72 **7 Claims**



1. In an electrometer system for non-contact detection of an electrostatic charge comprising a probe electrode and an electrometer circuit having a power supply voltage and including an electrically floating input circuit for said probe electrode, said electrometer circuit providing an output signal to an output level indicator means indicating a voltage on said probe electrode, and wherein said electrometer circuit has zeroing means and switch means selectively connecting said zeroing means with said input circuit for normally providing zeroing of said indicator means with a zero output signal, the improvement comprising:

reference voltage means providing a reference voltage,

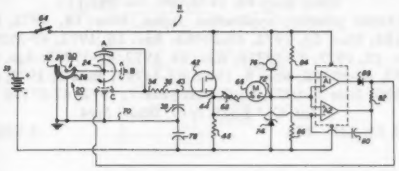
inhibited voltage comparison means comparing said power supply voltage against said reference voltage and providing an indicator signal output only in response to said power supply voltage falling below said reference voltage;

and connecting means for connecting said inhibited voltage comparison means to said input circuit when said switch means is connecting said zeroing means to said input circuit to provide a non-zero output signal only when said indicator signal is produced by said inhibited voltage comparison means, said non-zero output signal corresponding to said indicator signal and being indicated by said indicator means during said normal zeroing of said indicator means, indicating a low power supply voltage.

3,935,532
AUTOMATIC ZEROING ELECTROMETER

David R. Shuey, Webster, and Robert J. Slomcenski, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1974, Ser. No. 532,797
Int. Cl.² G01R 31/02
U.S. Cl. 324—72 9 Claims



1. In an electrometer system for non-contact detection of an electrostatic charge comprising a probe electrode and an electrometer circuit having a power supply voltage and including an electrically floating input circuit for said probe electrode, said electrometer providing an output signal corresponding to a voltage on said probe electrode, the improvement comprising:

voltage isolation means connected between said input circuit and said power supply voltage to electrically float said power supply voltage relative to input circuit;

feedback means for feeding back a feedback voltage corresponding to said output signal to said voltage isolation means for resetting said floating voltage level of said power supply relative to said input circuit as a function of said output signal for automatically zeroing said output signal;

wherein said voltage isolation means stores and retains said feedback voltage from said feedback means and applies said feedback voltage to said input circuit;

first switch means for selectively connecting said voltage isolation means to said feedback means for rezeroing said output signal; and

alternatively selectable second switch means for connecting said probe electrode to said input circuit to apply thereto a voltage induced on said probe electrode, together with said feedback voltage stored in said voltage isolation means, to jointly provide said output signal,

wherein said feedback means is disconnected from both said input circuit and said voltage isolation means by said second switch means.

3,935,533
SINGLE OSCILLATOR MICROWAVE TRANSCEIVER

Salvatore Amoroso, Jr., Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 337,609, March 2, 1973, abandoned.
This application Aug. 29, 1974, Ser. No. 501,721
Int. Cl.² H04B 1/40
U.S. Cl. 325—20 14 Claims

1. A single oscillator microwave transceiver comprising:

a single microwave oscillator having a frequency-controlling voltage input;

an FM receiver;

antenna means for transmitting and receiving microwave energy;

means for coupling energy from said oscillator to said antenna means for transmission thereby, and for simultaneously coupling energy received at said antenna means and a small portion of the energy of said oscillator in mixed fashion to the input of said FM receiver;

an AFC circuit connected to the output of said FM receiver;

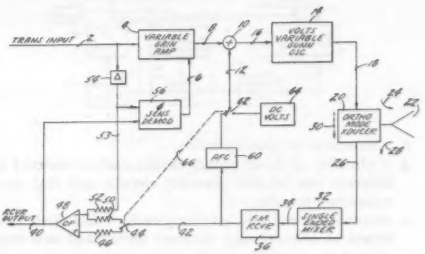
means for providing a substantially DC voltage suitable for controlling the carrier frequency of said microwave oscillator;

summing means, the output of said summing means being connected to said frequency-controlling voltage input of said microwave oscillator;

input means for applying transmitter input modulation to one input of said summing means; and

first selectively operable means for connecting said AFC circuit or carrier voltage means to a second input of said summing means, alternatively, whereby said microwave oscillator provides a carrier frequency selectively determined by said AFC circuit or by said carrier voltage means, which is frequency modulated in accordance with said transmitter input modulation;

wherein said input means includes a variable gain amplifier having a signal input and a gain control input, said signal input being connected to transmitter input modulation, the output of said variable gain amplifier being connected to the first input of said summing means;



delay means responsive to transmitter input modulation for providindg delayed transmitter input modulation which is delayed by a period of time substantially equal to the circuit signal propagation time from the input of said variable gain amplifier through said FM receiver;

second selectively operable means responsive to the output of said FM receiver and to the output of said delay means for selectively combining said delayed transmitter input modulation with the output of said FM receiver in a voltage polarity relationship to provide a receiver output signal having transmitter input modulation substantially cancelled therefrom; and

means responsive to said receiver output signal and to said delayed transmitter input modulation for providing a gain control signal to the gain control input of said variable gain amplifier, said gain control signal adjusting the gain of said variable gain amplifier so that the magnitude of transmitter input modulation included in the output of said FM receiver is adjusted with respect to the magnitude of delayed transmitter input modulation provided by said delay unit so that the transmitter input modulation in said receiver output signal is substantially nulled to zero.

3,935,534
CONVERTER-TUNER FOR INFORMATION TRANSMISSION SYSTEM

David E. Lewis, Orange, and Thomas F. Gossard, Studio City, both of Calif., assignors to Columbia Pictures Industries, Inc., New York, N.Y.

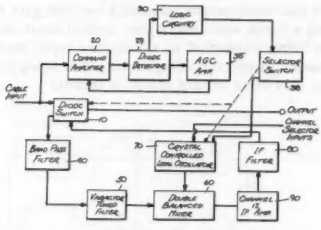
Filed Nov. 15, 1972, Ser. No. 306,869
Int. Cl.² H04H 1/00
U.S. Cl. 325—308 15 Claims

1. In a converter-tuner apparatus for selectively converting each of a plurality of cable television modulated carrier signals having different carrier frequencies to a predetermined frequency to be coupled to a television receiver, the converter-tuner apparatus having an input for receiving the carrier signals, a filter connected to the input for passing substantially

only the carrier frequencies, a mixer connected to the filter output, a variable frequency local oscillator connected to the mixer, the mixer being adapted to convert separately each carrier signal to the predetermined frequency, the improvement comprising a local oscillator comprising:

a. a plurality of resonant circuits each being resonant to a different frequency;

b. a plurality of frequency control crystals each connected to a different one of said plurality of resonant circuits, each crystal being conditioned to oscillate as a function of the frequency of said resonant circuit to which it is connected, said crystals precisely controlling the resonant frequency of said resonant circuits



c. a transistor oscillator circuit;

d. a plurality of diode switch means each connected to a different one of said resonant circuits and said crystal connected thereto;

e. means for selectively actuating each of said diode switch means to connect said resonant circuit and said crystal related thereto into said transistor oscillator circuit; and

f. means coupled to the local oscillator for coupling a component of a harmonic frequency of the local oscillator in a phase reversed sense into the converter-tuner apparatus prior to the mixer to substantially null the component of the harmonic of the local oscillator from interfering with the carrier signal being converted,

whereby the predetermined frequency can be precisely controlled for each of the plurality of modulated carrier signals.

3,935,535

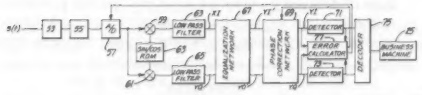
FAST EQUALIZATION ACQUISITION FOR AUTOMATIC ADAPTIVE DIGITAL MODEM

David M. Motley, Santa Ana, and King Y. Cheng, Tustin, both of Calif., assignors to Hycom Incorporated, Irvine, Calif.

Filed Sept. 9, 1974, Ser. No. 504,440

Int. Cl.² H04B 1/10

U.S. Cl. 325—324 **19 Claims**



1. An apparatus for processing a random data signal comprising:

equalizing means for equalizing the random data signal to provide a substantially equalized data signal, said equalizing means including variable gain means for subjecting the random data signal to at least one of a plurality of gains;

partial response detector means for detecting the data in the equalized signal to provide a partial response data signal;

means for detecting a first data sequence in the partial response data signal; and

means responsive to the detection of said first data sequence in the partial response data signal for adjusting the variable gain means of the equalizer whereby the equalizer is rapidly adjusted using random data.

3,935,536

GHOST SIGNAL CANCELLATION SYSTEM

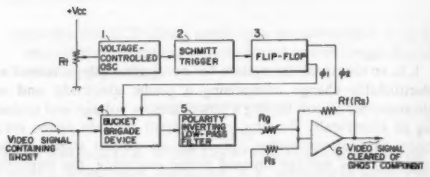
Takeji Kimura, Hirakata; Tomio Oyama, Toyonaka; Haruyasu Yamada, Kadoma; Shuzi Harada, Matsubara; Hirokazu Yoshino, Katano, and Eiichi Tsuboka, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 14, 1973, Ser. No. 341,121

Claims priority, application Japan, Mar. 16, 1972, 47-27184; Mar. 23, 1972, 47-29483; Apr. 18, 1972, 47-39275; Apr. 18, 1972, 47-39276; Apr. 18, 1972, 47-39277; Apr. 18, 1972, 47-39278; May 6, 1972, 47-44792; June 3, 1972, 47-55300; June 3, 1972, 47-55301; June 7, 1972, 47-57124

Int. Cl.² H04B 1/10; H04N 5/44

U.S. Cl. 325—476 **5 Claims**



1. A ghost signal cancellation system comprising:

means for receiving a signal transmitted from transmitting means;

delay means for providing a predetermined delay time, said delay means including a clock-controlled delay device;

delay time control means for setting a delay time of said delay means to a given value in accordance with the delay time of a ghost signal contained in said received signal, said delay time control means including an oscillator having a variable oscillation frequency and means for supplying an output of said oscillator to said delay device as clock signals;

means for receiving an output of said delay means and controlling a gain of said output in accordance with a level of said ghost signal;

means for subtracting said gain-controlled signal from said received signal, and

means for feeding back an output of said subtracting means to said delay means, wherein an output of said gain control means is further substracted from the received signal in a secondary subtraction circuit to produce a system output signal.

3,935,537

APPARATUS FOR MEASURING ANGULAR MOVEMENT

Richard William Batchelor, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Apr. 2, 1974, Ser. No. 457,185

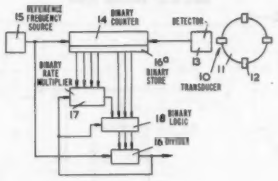
Claims priority, application United Kingdom, Apr. 3, 1973, 15866/73

Int. Cl.² G01P 3/48

U.S. Cl. 328—5 **5 Claims**

1. Apparatus for measuring the angular movement of a body, comprising: a transducer detector for providing a signal the frequency f_i of which is dependent on the angular velocity of the body; a reference frequency source providing a reference frequency f_r, an $(n + m)$ stage binary counter having a first input connected to said transducer detector and a second input connected to said reference frequency source, for counting the number of reference pulses in time period $1/f_i$; an $(n + m)$ stage binary store for receiving a count from said counter when the latter receives a signal from the transducer detector; an n-stage binary rate multiplier having a first input for receiving the n least significant figures of the store, and a second input for receiving an output signal from the appara-

tus; said rate multiplier being arranged to generate, during the period in which the rate multiplier receives 2^n binary pulses at said second input, a number of output pulses which is equal to the number of pulses applied to said first input; dividing means receiving first input signals equal to the m most significant figures of the store in the absence of an output signal from said rate multiplier, and receiving second input signals from said reference source; said dividing means producing an output



signal which forms said output signal of the apparatus and which is determined by dividing the frequency reference signal by the signal applied to said first input of the dividing means; and logic means modifying the output signal from said dividing means when an output signal is obtained from said rate multiplier; whereby 2^n output pulses are received between successive input pulses from the transducer detector, the maximum value of f_r/f_i being 2^{n+m}, and the minimum value of f_r/f_i being 2^n.

3,935,538
DIGITAL FREQUENCY-CONTROL CIRCUIT

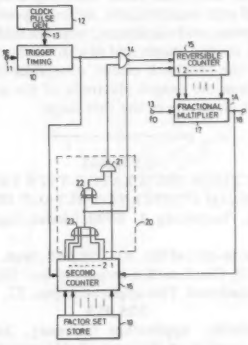
Harald Kizler, Stuttgart; Bernd Przybyla, and Peter-Jürgen Schmidt, both of Schwieberdingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 21, 1974, Ser. No. 499,337

Claims priority, application Germany, Sept. 22, 1973, 2347839

Int. Cl.² H03K *5/00*

U.S. Cl. 328—38 **21 Claims**



1. A digital frequency control circuit comprising:

a reversible counter;

a digital multiplying stage arranged for control of one of its factors by said reversible counter, said multiplying stage (17) serving as a controlled variable frequency generator of said frequency control circuit;

a frequency divider stage comprising a second counter (16) and a storage circuit, the content of which determines its frequency division factor, said content being arranged to be counted out repeatedly at the output frequency of said multiplier stage (17); and

means for determining the content of said second counter (16) at the beginning of a new input signal (f_e) and for correctively changing the stored content of said reversible counter (15) in response thereto, said last-mentioned means serving as comparison means for the frequency control circuit.

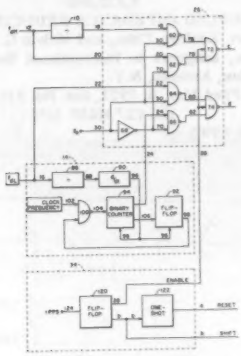
3,935,539
A-C SIGNAL MULTIPLYING CIRCUIT BY A RATIO OF WHOLE NUMBERS THE NUMERATOR OF WHICH IS GREATER THAN ONE AND GREATER THAN THE DENOMINATOR

John L. Linder, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 459,146, April 8, 1974, Pat. No. 3,882,303. This application Oct. 21, 1974, Ser. No. 516,540

Int. Cl.² H03K *5/156;* **G06G** *7/161*

U.S. Cl. 328—38 **1 Claim**



1. A frequency multiplier circuit for frequency-multiplying an a-c signal by a ratio of whole numbers wherein the absolute value of the numerator of said ratio is greater than the absolute value of the denominator of said ratio and greater than one comprising:

a. means for providing an a-c signal;

b. means for providing a clock-frequency-signal of frequency greater than said a-c signal, said clock-frequency-signal providing means having an output;

c. means for receiving and dividing the frequency of said a-c signal by a first predetermined whole number greater than one said receiving and dividing means having an output;

d. a differentiator circuit having an input and an output, said input being connected to said output of said means for receiving and dividing the frequency of said a-c signal by a first whole number greater than one;

e. a clock gate curcuit having a clock-frequency-signal input, a second input and an output, said clock-frequency-signal input being connected to said output of said means for providing a clock-frequency-signal;

f. a binary counter circuit having a first input, a second input, a first output, and a second output, said second input being connected to said output of said differentiator circuit, said first input being connected to said output of said clock gate circuit; and

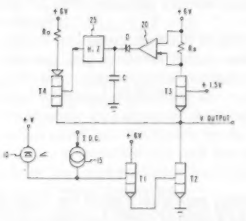
g. a flip-flop circuit having a first input, a second input, and an output, said first input being connected to said second output of said binary counter circuit, said second input being connected to said output of said differentiator circuit, said output of said flip-flop circuit being connected to said second input of said clock gate circuit, the signal on the output of said differentiator circuit resets

said binary counter circuit and said flip-flop circuit, then said flip-flop circuit enables said clock gate circuit passing said clock frequency signal to said binary counter circuit, after counting a predetermined second whole number of cycles of said clock frequency signal, said second whole number being greater than one and greater than said first whole number, said binary counter circuit clocks said flip-flop circuit, causing said flip-flop circuit to inhibit said clock gate circuit until said differentiator circuit resets said binary counter circuit and said flip-flop circuit, whereby for every cycle of said frequency-divided a-c signal, said second whole number of cycles of said clock-frequency-signal appears on said binary counter circuit first output, said second whole number of cycles of said clock-frequency-signal appearing on said binary counter circuit first output being said ratio-of-whole-numbers, frequency multiplied, a-c signal.

3,935,540
D.C. COUPLED IMPEDANCE REDUCING CIRCUIT

Gary A. Hart, Boulder, Colo., and Melvin G. Wilson, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1971, Ser. No. 121,912
Int. Cl.² H03F 3/38
U.S. Cl. 330—10 **14 Claims**

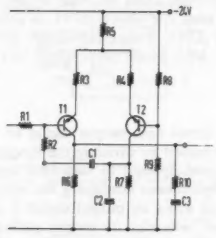


1. An impedance reducing circuit comprising:
a signal input source for perodically providing a varying signal;
semi-conductor amplifying means having an input impedance varying inversely proportional to input current and including feed forward and feed backward sections, said feed forward section having both voltage and current outputs;
means for coupling said signal input source to a semi-conductor junction in said feed forward section of said amplifying means;
means for supplying a D.C. steady state current to said semi-conductor junction of said amplifying means of a magnitude at least three times greater than the peak magnitude of said varying signal to provide a constant reduction of input impedance of said amplifying means whereby within said feed forward section of said amplifying means there is an amplified signal having both varying signal and D.C. steady state current components; and
take out current generating means connected within the feed backward section of said amplifying means and responsive to the D.C. current component coming from said feed forward section of said amplifying means for generating a take out current component equal to said amplified D.C. steady state current and supplying said take out current to said feed forward section for preventing said amplified D.C. steady state current from affecting said voltage output whereby only said amplified varying signal component appears at said voltage output.

3,935,541
LOCKED OSCILLATOR WITH DAMPED OSCILLATORY FEEDBACK

Wilhelm Amend, Baierbrunn, Buchenhain, and Toma Sotirovic, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 16, 1974, Ser. No. 488,999
Claims priority, application Germany, July 16, 1973, 2336132
Int. Cl.² H03B 3/04
U.S. Cl. 331—4 **2 Claims**



1. The combination comprising:
a reference oscillator,
a controlled oscillator having a control input to adjust its oscillation frequency,
a discriminator having inputs received from both said oscillators for comparing the frequencies of each and producing a desired output indicative of the difference frequency therebetween,
an amplifier receiving as its input, the output of said discriminator, and having its output coupled to the control input of the controlled oscillator,
said amplifier having an ac feedback coupling circuit with its parameters chosen to cause said amplifier to carry out a damped oscillation after receiving a signal from the output of said discriminator, indicating non-synchronization between said oscillators, wherein said amplifier has first and second stages and is a difference amplifier and wherein the feedback circuit comprises an ac coupling means from the output electrode of the second stage to the input electrode of the first stage.

3,935,542
CONTACTLESS OSCILLATOR-TYPE PROXIMITY SENSOR WITH CONSTANT-VOLTAGE IMPEDANCE

Robert Buck, Torkelweg 4, 8990 Lindau-Enzisweiler, Germany

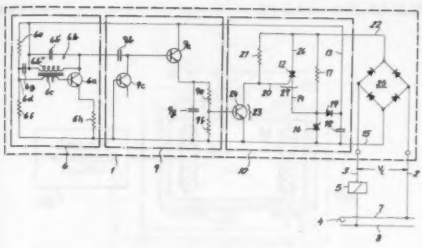
Continuation-in-part of Ser. No. 290,866, Sept. 21, 1972, Pat. No. 3,747,010, Continuation-in-part of Ser. No. 80,016, Oct. 12, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,953
Claims priority, application Germany, Jan. 22, 1972, 2203038The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl.² H01H 36/00; H03B 5/12
U.S. Cl. 331—65 **18 Claims**

1. A proximity sensor comprising:
detector means sensitive to the approach of an extraneous element for generating in an ouput circuit a control signal varying with the distance of such element from a predetermined location, said detector means being provided with a pair of power-input terminals;
a voltage-generating network including a constant-voltage impedance and an ancillary resistance in series therewith, said terminals being connected across said constant-voltage impedance;

a supply circuit including a source of direct current connected across said network;

binary electronic switch means connected in shunt with at least part of said network across said source;

trigger means coupled to said output circuit and connected to said switch means for reversing the state of conductivity thereof in response to a predetermined change in said control signal, thereby modifying the flow of current



through said ancillary resistance with maintenance of a sufficient current flow through said constant-voltage impedance to keep said detector means operative in either state of conductivity of said switch means; and

indicator means in said supply circuit responsive to changes in the state of conductivity of said switch means to register a predetermined variation of said control signal representing an approach of said element within a specified distance.

3,935,543

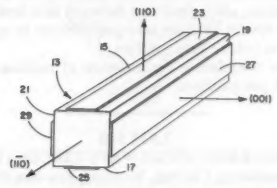
LASER MODE LOCKING AND COUPLING METHOD AND APPARATUS

Ronald G. Eguchi, Torrance; Michael M. Mann, Palos Verdes Estates; William B. Lacina, Los Angeles, and Kay C. Crill, Long Beach, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Continuation of Ser. No. 192,583, Oct. 21, 1971. This application July 11, 1974, Ser. No. 487,754

Int. Cl.² H01S *3/098, 3/10*

U.S. Cl. 331—94.5 M **8 Claims**



2. In a laser having a lasing medium disposed within a cavity for generating a beam of electromagnetic energy and providing a resonant optical path for said beam, the improvement which comprises:

means for linearly polarizing said beam,

a single electrooptic element having at least two pairs of opposed faces, said element being disposed in the path of said polarized beam such that the beam passes between both of said pairs of faces,

means for applying a first electrical signal between a first pair of said faces to induce a perturbation in said element so as to lock modes of oscillation of the beam,

means for applying a second electrical signal between the second pair of said faces to elliptically polarize said beam, and

means disposed in the path of the elliptically polarized beam for coupling a portion of said beam outside of the resonant optical beam path.

3,935,544

GAS LASER STRUCTURE FOR ELIMINATING PARASITIC ARCING

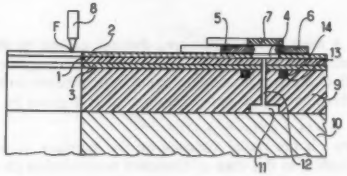
Bruno Godard, Gif sur Yvette; Bernard Lacour, Palaiseau, and Jean-Paul Gaffard, Plaisir, all of France, assignors to Compagnie Generale d'Electricite, Paris Cedex, France

Filed Dec. 24, 1974, Ser. No. 536,061

Claims priority, application France, Dec. 27, 1973, 73.46561

Int. Cl.² H01S *3/097, 3/03*

U.S. Cl. 331—94.5 PE **5 Claims**



1. In a traveling wave transmission line system for excitation of a laser having:

an active gaseous medium;

a flat electric energizing line consisting of an insulating layer inserted between a first and second metallic layer, parallel to each other and connected respectively to the two terminals of a voltage source, the said first metallic layer having at least one slot separating it into two distinct parts;

means for maintaining an active gaseous medium flowing in the said slot comprising metallic chocks (5,6) the edges of each of the said layers being in the form of a parabola whose axis forms an angle greater than zero with the line perpendicular to the slot; and

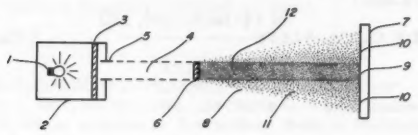
means for generating a current wave in the said line, constituted by a circuit for setting up a substantially punctiform discharge between the said metallic layers at the level of the foci of the parabolas;

the improvement wherein said flat electric energizing line is arranged through the said second metallic layer (3) on a massive plate (9) comprising on the one hand a cut (11) formed on its inside face substantially opposite the slot (4) and communicating with that latter through several channels (12) and on the other hand, two grooves (13) formed on its upper face and each having fitted in it at least on seal (14) made of a flexible material, the said grooves (13) being arranged substantially opposite the ends of the said first metallic layer (2) limiting the said slot (4), the gaseous medium in the volume formed by said slot, channels and cut being at a lower pressure than ambient atmospheric pressure for deforming said seal in said grooves for pressing the ends of said first metallic layer hard against the ends of said metallic chocks or improving the electrical contact between said chocks and said distinct parts.

3,935,545
METHOD AND APPARATUS FOR REDUCING DIFFRACTION-INDUCED DAMAGE IN HIGH POWER LASER AMPLIFIER SYSTEMS

Anthony J. Campillo; Brian E. Newnam; Stanley L. Shapiro, and N. James Terrell, Jr., all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,225
Int. Cl.² H01S 3/02
U.S. Cl. 331—94.5 C 5 Claims



1. A method for minimizing damage caused by diffraction-induced self focusing in high-power laser amplifier systems which comprises passing the input optical beam through a soft aperture having an optical transmission T given by

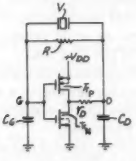
$$T = [1 + e^{-S}(e^{r^2/w^2} - 1)]^{-1}$$

where r is the radial distance on the aperture, w is the spot-size radius in the case of Gaussian transmission ($S = 0$), and S is a shape factor characterizing the aperture.

3,935,546
COMPLEMENTARY MOS TRANSISTOR CRYSTAL OSCILLATOR CIRCUIT

Shinji Morozumi, Shimosuwa, and Mitsuharu Kodaira, Suwa, both of Japan, assignors to Kabushiki Kaisha Seikosha, Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 423,961
Claims priority, application Japan, Dec. 12, 1972, 47-124665
Int. Cl.² H03B 5/36
U.S. Cl. 331—116 R 5 Claims

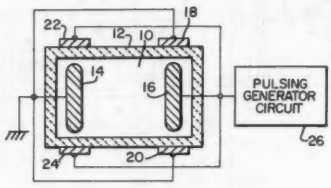


1. A quartz crystal oscillator circuit comprising a quartz crystal vibrator, an output resistor, a feedback resistor, and an inverter circuit said inverter circuit including an N-channel and a P-channel MOS field effect transistor coupled at the drain terminals thereof to a first side of the output resistor, the other side of the output resistor defining an output terminal, said output terminal being coupled through said vibrator to said input terminal of said inverter circuit defined by a coupling of the gate terminals of said transistors, said output terminal being further coupled through said feedback resistor to said gate terminals of said transistors.

3,935,547
HIGH PRESSURE GAS LASER USING UNIFORM FIELD ELECTRODE CONFIGURATION WITH IRRADIATION BY CORONA DISCHARGE

Henry Riemersma, Pittsburgh, Pa., and Owen Farish, Bearsden, Glasgow, Scotland, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 30, 1973, Ser. No. 365,391
Int. Cl.² H01S 3/097, 3/22
U.S. Cl. 331—94.5 PE 16 Claims



9. A high pressure gas laser, capable of producing stimulated emission of radiation, comprising:

an enclosure,

a gas medium at high pressure suitable for lasing action,

an electrode assembly having first and second spaced apart electrodes with continuous surfaces defining a uniform field gap therebetween,

a first set of members of a high dielectric constant material fixedly and conductively attached to the first electrode and extending into said gap,

a second set of members of a high dielectric constant material fixedly and conductively attached to the second electrode and extending into said gap so that end surfaces of corresponding members of said first and second sets are in contiguous relationship,

pulsing means connected to said first and second electrodes for applying pulsed energy to said gap for stressing said uniform field gap and for generating corona discharges between said first and second sets of members for supplying free electrons to said uniform field gap and for irradiating said first electrode with ultraviolet radiation to cause emission of additional electrons for initiating and maintaining glow discharge between said first and second electrodes for exciting said gas medium to upper energy levels to induce lasing action,

means for stimulating the emission of radiation from said excited gas medium.

3,935,548
WIDE-BAND MICROWAVE CIRCULATOR

Fred J. Rosenbaum, Clayton, Mo., and You-Sun Wu, Richardson, Tex., assignors to The Washington University, St. Louis, Mo.

Filed June 4, 1974, Ser. No. 476,234
Int. Cl.² H01P 1/36, 1/38
U.S. Cl. 333—1.1 5 Claims

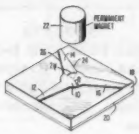
1. A method of making a wide-band Y-junction microwave circulator of the type including a ground plate associated with a ferrite substrate on which is superposed a conductive planar circular disc having three conductive transmission ports extending radially from the periphery of the disc and spaced apart by 120°, the method comprising the steps of:

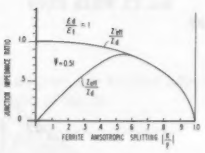
a. determining as a first function the intrinsic ferrite wave impedance ratio vs. the ferrite's known anisotropic splitting factor $|k/u|$, where k and u are the ferrite's permeability tensor elements;

b. selecting and making the coupling angle of each port at its junction with the disc such that a second function, the required junction wave impedance ratio vs. $|k/u|$, coin-

cides with said first function at a plurality of values of $|k/u|$; and

c. selecting and making the radius R of the disc for the selected coupling angle such that the product of S and R



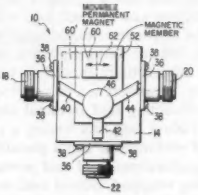


has a value corresponding to a selected $|k/u|$ value within the range of the plurality of coincident $|k/u|$ values for said first and second functions, where S is the radial propagation constant of the disc.

3,935,549
FERRITE CIRCULATOR

Ronald E. Jachowski, Scottsdale, Ariz., assignor to Decibel Products, Inc., Dallas, Tex.

Filed Aug. 12, 1974, Ser. No. 496,903
Int. Cl.² H01P 1/38, 1/36
U.S. Cl. 333—1.1 17 Claims

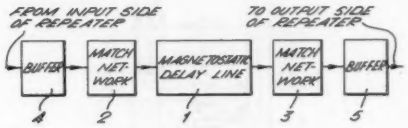


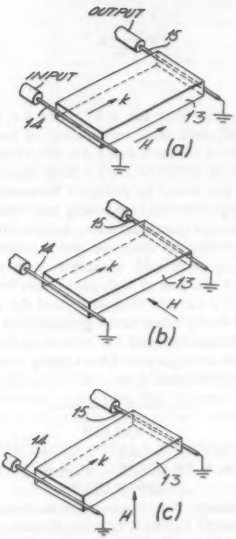
1. A circulator comprising a pair of spaced parallel electrically conductive plates forming outer conductors for said circulator, a plurality of inner conductors forming a central junction and extending outwardly from said junction between said plates, a plurality of electrical connectors forming ports joined to said plates and respective inner conductors, a ferrite element between each side of said junction and the adjacent outer conductor, a pair of elongated magnetic members located on opposite sides of said junction between said plates and said respective ferrite elements, said members extending to a location remote from said junction, and a permanent magnet between said members at said location, said permanent magnet being slidably mounted between said members for manual movement between said members for manual movement between a first position in which a greater portion of said magnet lies between said magnetic members and a second position wherein a lesser portion of said magnet lies between said members.

3,935,550
GROUP DELAY EQUALISER

John Douglas Adam, 10 Bonaly Grove, Edinburgh, EH13 OQD, and Jeffrey Hamilton Collins, 47 Dalmahoy Crescent, Balerno, Midlothian, both of Scotland

Filed Sept. 11, 1974, Ser. No. 505,175
Claims priority, application United Kingdom, Sept. 12, 1973, 42943/73
Int. Cl.² H03H 7/14, 9/30
U.S. Cl. 333—28 R 13 Claims





1. A group delay equaliser including:

a substrate of monocrystalline Gadolinium Gallium Garnet;

a layer of monocrystalline Yttrium Iron Garnet epitaxially grown on said substrate, said layer having a thickness in the range of 1 to 200 microns and being capable of propogating magnetostatic waves;

a first transducer and a second transducer located in spaced apart relationship in association with said layer to define a magnetostatic wave propagation path between said first and second transducers;

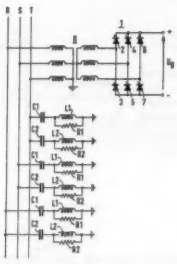
said propagation path having a dispersive characteristic over a selected frequency range and said first and second transducers being operable to convert electromagnetic wave energy into magnetostatic wave energy and vice versa in said selected frequency range; and

means for applying biasing magnetic field to said layer along said magnetostatic wave propagation path, said means being adjustable to adjust the value of said biasing field and thereby adjust the dispersive characteristic of said propagation path.

3,935,551
FILTER ARRANGEMENT FOR A CONVERTER CIRCUIT

Wolfgang Henniger, Erlangen; Dusan Povh, Nuremberg, and Manfred Schraudolph, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 5, 1974, Ser. No. 448,296
Claims priority, application Germany, Mar. 8, 1973, 2311534
Int. Cl.[2] H03H 7/04; H02M 1/12
U.S. Cl. 333—76 1 Claim

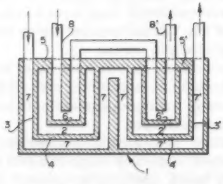


1. In a harmonic filter for a 12-pulse d-c to a-c voltage converter circuit, said filter being coupled between a three phase a-c electrical network and a d-c electrical network, and including a pair of parallel-coupled filter circuits for each a-c phase which are tuned to different harmonic current frequencies, the improvement comprising said filter circuits each comprising high-pass filters including a capacitor, and a parallel circuit comprising an inductor and a resistor coupled in series relationship with said capacitor, with the cutoff frequency of one of said pair of high-pass filters being lower than the fifth harmonic current frequency and the resonance frequency thereof being equal to or greater than the 11th harmonic current frequency, and the resonance frequency of the other of said pair of high-pass filters being equal to the 24th harmonic current frequency.

3,935,552
TWO REFERENCE CAVITY STRUCTURE FOR FREQUENCY TRACKING AS A FUNCTION OF TEMPERATURE

Ronald M. Hutcheon, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 17, 1975, Ser. No. 559,257
Claims priority, application Canada, Nov. 18, 1974, 214017
Int. Cl.[2] H01P 1/30, 7/04
U.S. Cl. 333—82 B 7 Claims



1. A two reference cavity structure for tracking the resonant frequency of a high power liquid cooled cavity structure comprising:

a first reference cavity having a first and second section, said first cavity tuned to a frequency below said resonant frequency;

a second reference cavity having a first and second section, said second cavity tuned to a frequency above said resonant frequency;

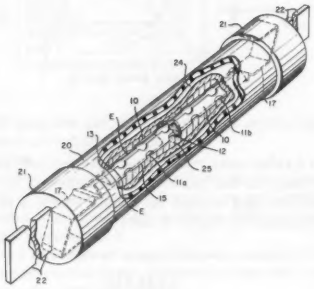
first means adapted to maintain said first sections at a first temperature; and

second means adapted to maintain said second sections at a second temperature.

3,935,553
CARTRIDGE FUSE FOR D-C CIRCUITS

Frederick J. Kozacka, South Hampton, N.H.; Edward J. Knapp, Jr., Newburyport, and Philip C. Jacobs, Jr., Newtonville, both of Mass., assignor to The Chase-Shawmut, Newburyport, Mass.

Filed Jan. 3, 1974, Ser. No. 430,537
Int. Cl. H01h 85/04
U.S. Cl. 337—159 4 Claims



1. A fuse for controlling d-c circuits including

a. a tubular casing of electric insulating material;

b. a pair of electroconductive terminal elements closing the ends of said casing;

c. a pulverulant arc-quenching filler inside said casing;

d. straight rod means of a gas-evolving electric insulating material inside said casing arranged substantially parallel to the longitudinal axis thereof, said rod means having a circumference of predetermined length; and

e. a ribbon fuse link including a portion having a predetermined width substantially exceeding said predetermined length of said circumference of said rod means conductively interconnecting said terminal elements, said portion of said ribbon fuse link having a plurality of transverse lines of perforations and a plurality of longitudinal columns of perforations, and said portion of said ribbon fuse link being wrapped around said rod means so as to position said rod means relative to said portion of said ribbon fuse link, and said portion of said ribbon fuse link forming a gap between the longitudinal edges thereof causing arc-quenching gases to escape from said rod means transversely across said longitudinal edges of said portion of said fuse link.

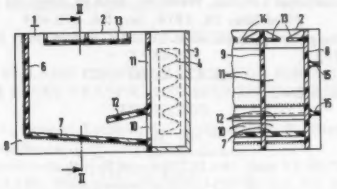
3,935,554
POLYPHASE LIQUID RHEOSTAT

Kurt Rabus, Heroldsberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 26, 1975, Ser. No. 562,052
Claims priority, application Germany, Mar. 28, 1974, 2415089
Int. Cl.[2] H01C 10/02
U.S. Cl. 338—80 11 Claims

1. In a polyphase liquid rheostat having electrodes arranged in insulated cells filled with electrolyte, said cells being covered at the top and opened at an end face, the improvement comprising cells formed from electrically non-conducting

plastic plates which are welded together in a liquid tight manner and wherein the welds, at least in the areas which will be



subject to voltage stresses, are located adjacent only to outer spaces which are free of liquid.

3,935,555
ASSEMBLY FOR FINE ADJUSTMENT OF A VARIABLE IMPEDANCE MECHANISM

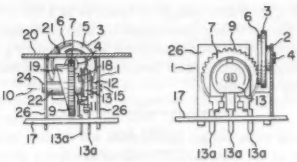
Matsuo Nishioka, and Shunzo Oka, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 10, 1974, Ser. No. 513,727

Claims priority, application Japan, Oct. 19, 1973, 48-121331[U]; Oct. 19, 1973, 48-121332[U]; Oct. 19, 1973, 48-121333[U]; Oct. 19, 1973, 48-121334[U]; Oct. 19, 1973, 48-121335[U]; Oct. 19, 1973, 48-121336[U]

Int. Cl.³ H01C 5/02

U.S. Cl. 338—174 **11 Claims**



1. An assembly for fine adjustment of a variable impedance mechanism comprising

a. a housing, a first disk-shaped rotary member mounted on a wall of said housing and having a raised spiral-shaped engaging means on one side surface thereof,

b. a second disk-shaped rotary member having teeth formed along the periphery thereof for engagement with said raised spiral engaging means of said first disk-shaped rotary member, said second disk-shaped rotary member having a rotary shaft arranged to rotate about an axis which is contained in a plane perpendicular to the axis of rotation of said first disk-shaped rotary member, said raised spiral-shaped engaging means of said first disk-shaped rotary member being so formed that the angle of rotation of said second disk-shaped rotary member is smaller than the angle of rotation of said first disk-shaped rotary member, and

c. a variable impedance element in said housing having a rotary shaft, and means for detachably coupling the rotary shaft of said second disk-shaped rotary member to the rotary shaft of the variable impedance element.

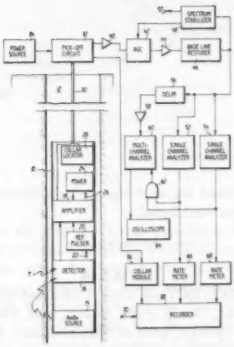
3,935,556
DUAL FUNCTION LOGGING TOOL AND METHOD

John G. Kampfer, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 381,474, July 23, 1973, Pat. No. 3,862,417. This application May 21, 1974, Ser. No. 471,900

Int. Cl.³ G01V 1/40; H04J 7/00; G01V 5/00

U.S. Cl. 340—18 CM **4 Claims**



3. In a data transmission system wherein amplitude variable data pulses and predetermined amplitude reference pulses are transmitted over a common transmission link, the method of transmitting additional data over the same transmission link without interference comprising the steps of:

a. providing a minimum acceptable number of constant frequency pulses;

b. providing a series of pulses related in number to the additional data to be transmitted;

c. providing constant amplitude pulses related in number to the sum of the constant frequency pulses and the additional data related pulses;

d. transmitting over the transmission link both the amplitude variable data pulses and the constant amplitude reference pulses;

e. separating the transmitted reference pulses from the transmitted amplitude variable data pulses; and,

f. subtracting from the separated reference pulses a number of pulses related to the constant frequency pulses to thereby provide a series of pulses related in number to the additional data.

3,935,557
GROUND POSITION INDICATOR SYSTEM

Dewey F. Nichols, Box 106, Hosston, La. 71043

Filed Mar. 22, 1974, Ser. No. 453,675

Int. Cl.³ G08G 5/00

U.S. Cl. 340—25 **6 Claims**

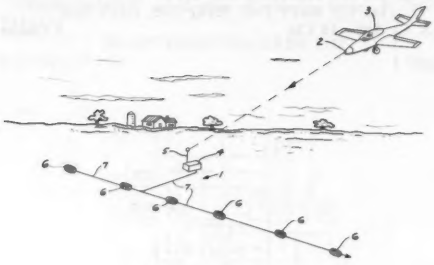
1. A ground position indicator system for air-to-ground coordination of an aircraft comprising:

a. A transmitter;

b. An antenna for receiving signals from said transmitter;

c. A ground located receiver carrying said antenna and adapted to interpret and execute said signals; and

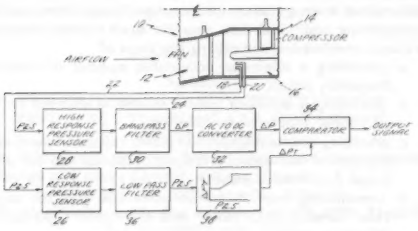
d. A ground located system of lights in cooperation with said receiver and each selectively energized and sequentially activated by said signals to selectively guide said aircraft over said lights.



3,935,558
SURGE DETECTOR FOR TURBINE ENGINES

Ronald J. Miller, North Palm Beach, and Thomas M. Randolph, Palm Springs, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 11, 1974, Ser. No. 531,636
Int. Cl.² G01M *15/00*; F02C *9/02*
U.S. Cl. 340—27 SS **10 Claims**

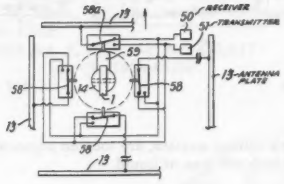


1. An indicator for a turbine engine comprising
pressure sensing means positioned in a flow path of said engine and producing signals which are a function of the gas pressure oscillations therein,
a band-pass filter connected to receive said signals and passing therethrough only the high frequency signal components characteristic of engine surge,
a low-pass filter also connected to receive said signals and passing therethrough only the low frequency signal components indicative of the steady state pressure,
means for producing from said low frequency signal components a triggering signal,
and comparator means for comparing said high frequency signal components with said triggering signal and producing an output signal when the amplitude of said high frequency signal components exceeds the amplitudes of said triggering signal.

3,935,559
TRANSPORTER SYSTEMS

Alan E. Straffon, Carshalton, and James C. King, Hemel Hempstead, both of England, assignors to Electronic Machine Control (Sales) Limited, Mitcham and Dexion-Comino International Limited, Wembley, both of, England

Filed May 16, 1974, Ser. No. 470,484
Claims priority, application United Kingdom, May 31, 1973, 25920/73
Int. Cl.² G08G *1/00*
U.S. Cl. 340—32 **8 Claims**

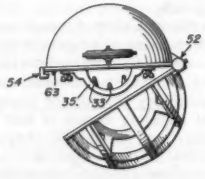


1. Tracked transporter apparatus comprising,
a plurality of cars each having a plurality of wheels mounted to swivel about an upright axis,
a power unit drivingly connected to at least one of said wheels,
steering means operable for imparting swivelling movement to said wheels to cause the car selectively to follow a predetermined track course,
means for detecting the proximity, in any direction, of another car, said detecting means comprising an electronic transmitter and receiver means operated alternately as a transmitter and as a receiver,
a plurality of antenna plates, one at each side of the car,
and switching means being controlled by said steering means of the car for selectively connecting one of said plates to said receiver means to serve as a receiving plate, concurrent control means for connecting said receiver means to said antenna plate to serve as a receiver and said other plates being connected by said switching means to said transmitter means to serve as transmitting plates, and means controlling said transmitter and receiver means to operate alternately.

3,935,560
LIGHT GUARD

Harry M. Dorn, 1133 Broadway, New York, N.Y. 10010

Filed Nov. 13, 1974, Ser. No. 523,398
Int. Cl.² F21V *15/00*
U.S. Cl. 240—102 B **11 Claims**



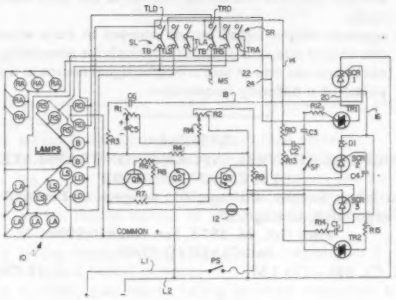
1. A light guard molded of a plastic material and comprising generally complimentary first and second body portions forming a generally cylindrical guard having a generally closed top end and a generally open bottom end, said generally open bottom end including clamp means for removably fixing the light guard to a light bulb socket support means, generally at least one of said body portions comprising a cage member, fixed axis hinge means for hingedly securing said first and second body portions, positive latch means for normally main-

taining said first and second body portions in closed relation, and said latch means including detent means for resisting radially inward and axial unlatching deformation of said first body portion relative to said second body portion, said detent means including an axially extending slot of generally C-shaped cross section for reception of a portion of one of said first and second body portions.

3,935,561
SIGNAL LAMP CONFIGURATION FOR DIRECTING HIGH SPEED TRAFFIC AND SEQUENCING MEANS THEREFOR

William L. Bruner, London, Ky., assignor to F. B. Electronics, London, Ky.

Continuation-in-part of Ser. No. 271,494, July 13, 1972, Pat. No. 3,883,846. This application July 9, 1974, Ser. No. 486,777
Int. Cl.² B60Q 7/00
U.S. Cl. 340—109 **2 Claims**



1. Circuit means for sequentially energizing a plurality of signal lights in an arrow configuration from the tail of said arrow toward the head thereof comprising:

timing oscillator means generating a first timing pulse for initiating a sequencing cycle and generating a second timing pulse for terminating said sequencing cycle;

a first silicon controlled rectifier means for energizing signal lamp means at the tail portion of the shank of said arrow in response to being triggered into conduction by said first timing pulse from said oscillator means;

a first triac means for energizing signal lamp means of the remaining portion of the shank as said triac is triggered into conduction a predetermined time after said first silicon controlled rectifier;

a second silicon controlled rectifier means for energizing signal lamp means defining the arrowhead of said arrow when said second silicon controlled rectifier is triggered into conduction a predetermined time after said first triac is rendered conductive; and

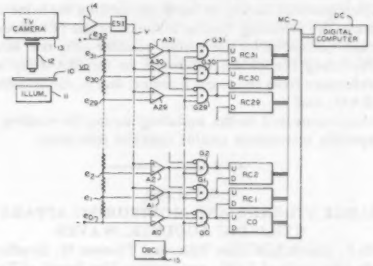
a third silicon controlled rectifier means which is rendered conductive in response to said second timing pulse from said oscillator to thereby turn OFF said first silicon controlled rectifier, said first triac, and said second silicon controlled rectifier to deenergize all of the signal lamps and terminate the sequencing cycle.

3,935,562
PATTERN RECOGNITION METHOD AND APPARATUS

Richard G. Stephens, 318 Security Mutual Life Bldg., Binghamton, N.Y. 13901

Filed Feb. 22, 1974, Ser. No. 444,951
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 AG **13 Claims**

1. In apparatus for classifying a pattern comprised of elemental areas situated fixedly with respect to each other within a scanning field, said elemental areas having three or more different light-remissive levels, the combination of scanning means for optically scanning said field and said elemental areas of said pattern with a plurality of successive scan lines to derive an electrical waveform having a parameter which varies in accordance with the light-remissive level of the elemental area being scanned at a given instant; signal processor means responsive to said electrical waveform for providing three or more groups of further signals, the signals of each group of further signals being provided during the times that

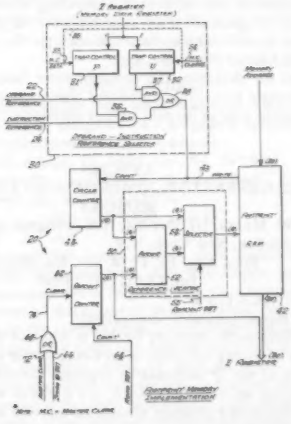


said parameter of said electrical waveform lies between a respective pair of values defining a respective range of light-remissive levels, whereby the time integral of each of said groups of further signals is commensurate with the total amount of area within said scanning field falling within a respective one of said ranges of light-remissive levels; and time-integrating accumulator means for separately accumulating the signals of predetermined combinations of said groups of further signals to provide three or more stored data signals defining values of a function characteristic of said pattern.

3,935,563
COMPUTER FOOTPRINT FILE

Robert A. Unger, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1975, Ser. No. 543,720
Int. Cl.² G06F 11/00
U.S. Cl. 340—172.5 **4 Claims**



1. Apparatus for keeping track of the progress of a computer program by selecting specific operand and/or instruction references, comprising:

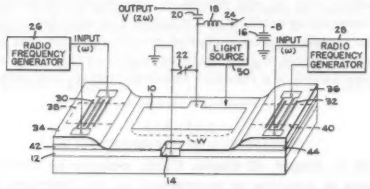
means for accessing an operand reference;
means for accessing an instruction reference;
means connected to a memory data register of the computer and to the two accessing means for selecting a specific operand or instruction reference which is to be monitored;
a random-acess memory (RAM), having three inputs, including one from a memory address and one comprising the output from the selecting means for writing the last N instruction and/or operand references, or any combination thereof into the RAM;
a circle counter having an input comprising the same output from the selecting means, for cycling the N references;
means connectd to the circle counter and the RAM of replacing the oldest reference in the RAM by a new reference from the circle counter, that is, for updating the RAM; and
means connected to the updating means for reading out a specific instruction and/or operand reference.

3,935,564

CHARGE STORAGE AND MONITORING APPARATUS UTILIZING ACOUSTIC WAVES

Calvin F. Quate, Los Altos Hills, and Thomas W. Grudkowski, Palo Alto, both of Calif., assignors to The Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Filed Dec. 2, 1974, Ser. No. 528,742
Int. Cl.² G11C *13/00, 27/00, 19/00*
U.S. Cl. 340—173 R **21 Claims**



1. Charge storage and monitoring apparatus utilizing acoustic waves which comprises:
a piezoelectric semiconductor,
a barrier electrode associated with said piezoelectric semiconductor and capable of supporting an electric charge,
means for generating an acoustic wave of selected amplitude in said semiconductor to traverse the same adjacent said barrier electrode, and
means for detecting the acoustic wave fields during such traversal to provide an output signal proportional to the electric charge on said barrier electrode.

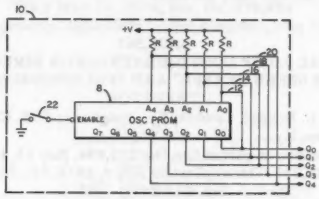
3,935,565

SIGNAL GENERATOR COMPRISING AN ADDRESSABLE MEMORY

Harry W. Moore, III, Dryden, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,789
Int. Cl.² G11C *13/00*
U.S. Cl. 340—173 R **5 Claims**

1. A signal generator, comprising:
an addressable memory having n separate input terminals for receiving the n-bits of an n-bit address word to address one of the 2^n addressable registers therein each register storing an n-bit data word, the n bits of which are each coupled to a separate associated one of *n* separate output terminals;
a plurality of n-bit data words of differing values, said data words stored in consecutively addressed ones of said registers;
n separate feedback means for directly coupling each separate one of said n output terminals back to only a separate associated one of said n input terminals;
means enabling said memory to read out the data word stored in a first one of its registers for continuously and repetitively cycling said memory through its 2^n registers



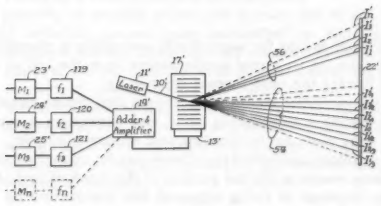
by using the read out data word as the address word to address the next addressed register at the next memory cycle;
n separate output signal means coupled to each separate one of said n separate output terminals for generating, on each separate one of said n output signal means, n timing pulses of n differing frequencies.

3,935,566

MULTIPLE-CHANNEL INFORMATION TRANSLATION SYSTEM AND METHOD

Paul Adam Snopko, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 26, 1973, Ser. No. 410,000
Int. Cl.² G11C *13/04*
U.S. Cl. 340—173 LM **11 Claims**



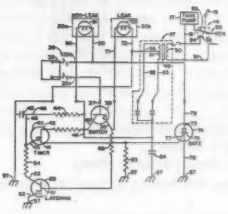
1. A multiple-channel information translation system for receiving a spatially coherent input light beam and a plural number greater than two of electrical input signals and for producing therefrom a like plural number of output light beams, each bearing amplitude information corresponding to one of said input signals, comprising:
carrier generating means for generating a plural number greater than two of electrical carriers, each having a different RF frequency;
modulating means for respectively amplitude modulating said carriers with the input signals to produce a like plural number of amplitude-modulated carrier signals; and
a light-sound interaction cell interposed in the path of the input light beams, said cell including a sound-propagative medium and transducer means coupled to said sound-propagative medium which receives said carrier signals and launches within said medium a corresponding plural number of acoustic beams, each having an acoustic frequency and amplitude modulation corresponding to a different one of said carrier signals, said cell Bragg-diffracting the input beam into a corresponding plural number of output light beams respectively amplitude modulated in accordance with the input signals,
said carrier generating means causing the frequencies of said carriers to be unequally spaced and such that the

frequency differences between each carrier frequency and all others are unequal so as to substantially suppress random, signal-related spurious amplitude modulation of said output beams.

3,935,567
LEAK DETECTION APPARATUS

David E. Reynolds, Littleton, Colo., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 8, 1974, Ser. No. 459,151
Int. Cl. G08b *21/00*
U.S. Cl. 340—242 6 Claims



1. A leak detection device for a system under pressure comprising:

a. means for detecting a predetermined pressure;

b. a bi-state means responsive to said detecting means having a first state when no leak is present and having a second state when a predetermined pressure is detected;

c. switch means having its input connected through said bi-state means;

d. timing means having a signal at its output after a predetermined period of time;

e. bi-stable gate means having its input connected to said timing means output;

f. a nonleak indicator means coupled to the output of said bi-stable gate means to indicate that no leak is present in the system;

g. means responsive to said second state coupled to said timing circuit and said switch means to eliminate said time output signal to said bi-state gate means and operate said switching means;

h. an indicator means coupled to said switching means to indicate that a leak has been detected; and

i. means for resetting said bi-stable gate.

3,935,568
UNIVERSAL ANALOG-TO-DIGITAL CONVERTER USING THE SAME INFORMATION DISC FOR DIFFERENT OUTPUT CODES

Joseph Samuel, Westbury, N.Y., assignor to Lem Instrument Corporation, Framingdale, N.Y.

Continuation of Ser. No. 201,964, Nov. 24, 1971, which is a continuation of Ser. No. 863,244, Oct. 2, 1969, abandoned.
This application Mar. 28, 1973, Ser. No. 345,692
Int. Cl. G08c *9/08;* H03k *13/02*
U.S. Cl. 340—347 P 2 Claims

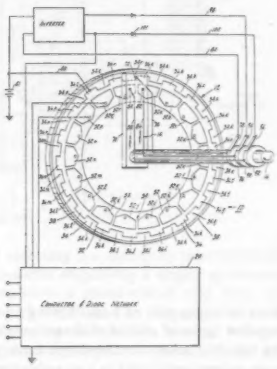
1. In an analog to digital converter for representing the angular position of a shaft as the potential condition of a plurality of output terminals, the combination of,

a stationary disc having only first and second coaxial rings of segments thereon, said first ring having pairs of alternately arranged conductive and nonconductive segments and said second ring having spaced conductive position indicator segments,

a first brush member operatively connected to said shaft and being rotatable relative to said stationary disc and carrying a sensing brush adapted to engage said segments of said first ring and a pair of leading and lagging brushes positioned to engage said position indicator segments of said second ring,

a plurality of output terminals of different ordinal significance, the presence of a potential on each of said output terminals being assigned a weighted decimal value and the number of said output terminals being less than the number of said position indicator segments,

means coupled to said sensing brush for applying a potential to said leading and lagging brushes when said sensing brush engages a nonconductive and a conductive segment in said first ring respectively, and means including a plurality of circuits for coupling said position indicator segments to said output terminals for transforming the analog quantities represented by the potentials with which said leading and lagging brushes energize said position indicator segments in the decimal sequence **0, 1, 2, 3, 4, 5,** etc. into binary coded digital signals on said output terminals the sum of whose weighted value is a function



of said sequence and of the angle of rotation of said first brush member and the shaft coupled thereto relative to said first stationary disc, certain of said circuits coupling individual ones of said position indicator segments to a plurality of said output terminals, and

means for applying said potential to and removing it from the output terminal of least ordinal significance when said sensing brush engages a conductive and nonconductive segment respectively of said first ring, the second, third, and fifth position indicator segments being individually coupled to the second, third and fourth output terminals respectively and the fourth position indicator segment being coupled to said second and third output terminals.

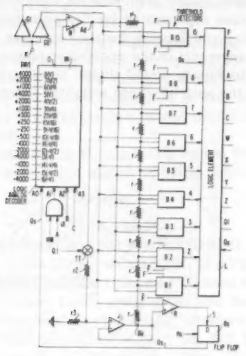
3,935,569
DIGITAL CODER

Francois Marcel, Orsay, and Alain Manoury, Viry-Chatillon, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Sept. 17, 1973, Ser. No. 397,924
Claims priority, application France, Sept. 15, 1972, 72.32892; Nov. 24, 1972, 72.41976
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD 8 Claims

1. A series-parallel coder subject to a compression law having several segments with different slopes, capable of providing, for a positive or negative sample, a first code defining the number of the segment, then a second code defining the position on the said segment, comprising a voltage divider having a voltage high point and voltage low point, a single set of threshold detectors, each of said threshold detectors formed of two amplifier-comparators connected in an arithmetical progression between said voltage high point and said voltage low point of said voltage divider, logic means receiving the outputs of said threshold detectors for selectively setting the potential of the voltage low point of said voltage divider either at zero potential or at a potential which is half the

voltage high point of said voltage divider and for applying to the voltage high point of the voltage divider a selected potential $V/2^n$, where V is a reference voltage and n may vary from O to k according to the order K of the segment, and amplifier means including two amplifiers for applying a segment signal to each of said threshold detectors in parallel, one of said two



amplifiers having a gain of 1 and having an output connected to a negative input of one of said two amplifier-comparators, and the other of said two amplifiers having a gain of 8 and having an output connected to a negative input of the other of said two amplifier-comparators, wherein said two amplifiers receive as a common input the level to be coded.

3,935,570

SPINNING-DISK SHAFT POSITION ENCODER

William H. Raser, 6451 W. 83rd St., Los Angeles, Calif. 90045

Filed July 22, 1974, Ser. No. 490,857
Int. Cl.² G08C 9/04
U.S. Cl. 340—347 P **4 Claims**

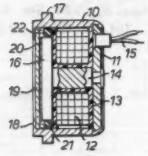
1. Apparatus for making digital measurements of shaft angular positions comprising:
- a housing having an axis and having a protruding shaft rotatably mounted on this axis;
- a housing-mounted bracket supporting an optical scanning means for producing and sensing a beam of light in a direction parallel to the axis of said housing;
- a first shaft-mounted bracket supporting a magnetic scanning means;
- an internal shaft rotatably supported about the axis of said housing;
- motive means to rotate said internal shaft;
- a magnetically-alterable opaque disk mounted on said internal shaft for communicating with the scanning means on each of said brackets once per revolution of said internal shaft, the magnetic communication thereof operating to generate impulses as a consequence of the angular velocity of said internal shaft;
- a pulse counter fed by said disk, the number of pulses per disk revolution being proportional to a shaft displacement angle so as to provide a first shaft angle measurement;
- a second protruding rotatably-mounted shaft coaxial with the first;
- a second shaft-mounted bracket with a second magnetic scanning head; and
- a second pulse generating and counting means for providing a digital measurement of the angle of said second protruding shaft.

3,935,571

ELECTRO-VISUAL INDICATORS

Raymond W. Sargent, Shelburne, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,741
Int. Cl.² G08B 5/00
U.S. Cl. 340—373 **11 Claims**



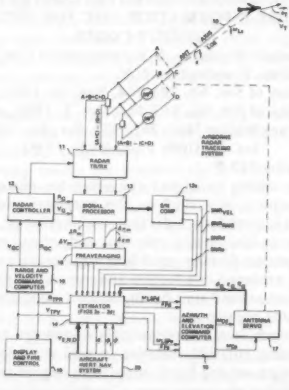
1. An electro-visual indicator,
comprising a housing,
a magnetic fluid partially filling
said housing and having a predetermined optical characteristic,
means defining a space within the housing having a first part of such cross-section that the magnetic fluid tends to flow into it by capillary action and a second part which is so positioned that the magnetic fluid may be drawn into this part by a magnetic field,
means in the housing defining a viewing window opening into part only of the said space and covered by light transmitting material, and
electromagnetic means in the housing energizable to provide a magnetic field for moving the magnetic fluid in said space in a manner which is visually distinguishable through the said window to provide an indication of the state of energization of the electromagnetic means.

3,935,572

SYSTEM FOR RESOLVING VELOCITY AMBIGUITY IN PULSE-DOPPLER RADAR

Laurence E. Broniwitz; Mark I. Landau, both of Los Angeles, and John B. Pearson, III, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 23, 1973, Ser. No. 418,692
Int. Cl.² G01S 9/44
U.S. Cl. 343—9 **9 Claims**



1. In a radar system for tracking a target aircraft, said system having antenna for cyclically sensing reflected electro-

magnetic energy from said target at a particular pulse repetition frequency, PRF, and wavelength, λ, and producing signals representing discriminants ΔR_m and ΔV_m of range and radial velocity, respectively, of said target relative to said tracking system, where said velocity discriminants are derived from doppler shift measurements, a separate filter for tracking target range and velocity, each filter responding to respective discriminants ΔR_m and ΔV_m to generate predictions of the next measurements from current estimates of filter states, where the states are vectors $X_R(i)$ and $X_V(i)$, and the subscript i indicates a value of time i, a method for resolving ambiguity of said vector $X_V(i)$ after a period of initial tracking sufficient for said range tracking filter to unambiguously achieve an accuracy in current estimates of states in said range filter for the difference between the first derivative of the range value in $X_R(i)$ effectively estimated as one of said range filter states, and the true doppler velocity to be a velocity less than λPRF/4, said method being performed by computer means for computing a corrected target velocity V_{TCORR} from doppler shift information in accordance with the equation

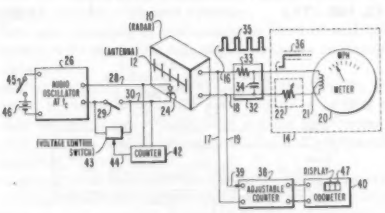
$$V_{TCORR} = \frac{\lambda}{2} PRF\ (f_{MLC}+f_{DAP}-f_{DP})PRF^{-1} + \frac{1}{2} *-(f_{DAP}+f_{MCL})$$

by the steps of determining f_{MLC} as an offset in a doppler shift spectra reference introduced to avoid main lobe clutter in the center of a doppler shift spectrum where the true target return is likely to be, f_{DAP} as the ambiguous doppler shift measurement derived from an ambiguous velocity estimate $X_V(i)$, and f_{DP} as actual doppler shift estimate derived as the estimate of the first derivative of the unambiguous velocity in $X_R(i)$, truncating the bracketed quantity as indicated by the asterisk by dropping the fractional part thereof of the bracketed quantity after the quotient of $(f_{MLC}+f_{DAP}-f_{DP})$ is divided by PRF and has been rounded by adding ½ to the quotient and subtracting $(f_{DAP}+f_{MCL})$ from the bracketed quantity and multiplying the difference by λ/2 PRF.

3,935,573
DOPPLER RADAR SENSOR CALIBRATOR

Henry Charles Johnson, Neshanic, N.J. 08853, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,847
Int. Cl.² G01S 7/40
U.S. Cl. 343—17.7 14 Claims



1. A method for calibrating a doppler radar sensor having an indicator coupled to the doppler signal output of said radar sensor for providing indicia manifesting doppler signal outputs comprising the steps of:

modulating a radar probe signal from said radar sensor with a modulating signal having a predetermined frequency corresponding to a predetermined doppler signal output by positioning a varying impedance in the near-field of said radar probe;

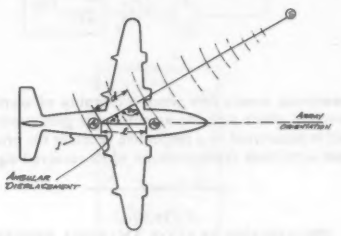
deriving a doppler signal output from said modulated radar probe, said doppler signal having a frequency equal to said predetermined modulating frequency, and

adjusting the doppler signal output of said radar sensor to provide an indication corresponding to said predetermined doppler signal output.

3,935,574
SIGNAL SOURCE POSITION-DETERMINING PROCESS

Panajiotis S. Pentheroudakis, Glendale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1974, Ser. No. 460,870
Int. Cl.² G01S 3/48
U.S. Cl. 343—113 R 10 Claims



1. A process of resolving the ambiguity inherent in the use of target-finding systems employing a target signal-receiving antenna array coupled to a phase meter, said array being a multi-lambda array characterized by the use of at least one pair of antennas having a baseline spacing substantially greater than the wave length of the target signal, the process comprising the steps of:

establishing theoretically predetermined date relative to the rate at which the phase difference between the antennas of the multi-lambda array varies with a monotonic 360° azimuthal variation in the relative positions of said array and said target, said predetermination inherently provided a plurality of rate of exchange lobes each defining a variation in phase difference between 360° and 0° with each lobe demonstrating an abrupt 360° phase difference discontinuity transition to its next successive lobe,

monotonically varying the angular attitude of said array baseline relative to said target,

phase tracking said target-signal during a known incremental portion of said angular attitude variation to provide measured phase difference data as well as phase rate-of-change data and lobe discontinuity data, and

matching said provided data with said predetermined data, the true bearing of the target signal being determined by degree of consistency between the provided data and the predetermined data.

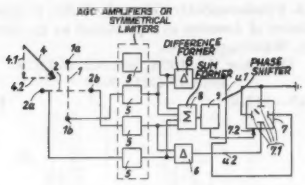
3,935,575
CIRCUITRY FOR DETERMINING DIRECTION OF IMPINGEMENT OF A RECEIVED SIGNAL

Reinhard Leisterer, Bremen; Walter Mahlstedt, Moordeich, and Manfred Rübel, Bremen, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Nov. 28, 1972, Ser. No. 310,074
Claims priority, application Germany, Dec. 3, 1971, 2159977
Int. Cl.² G01S 5/02
U.S. Cl. 343—113 R 14 Claims

1. In a system for the determination of the direction of impingement of a received energy signal including receiver means composed of a plurality of receivers constituting pairs of mutually perpendicular dipoles for receiving orthogonal components of the impinging signal, means connected to the receivers for measuring the unfiltered received components of

signals for producing output signals indicative of the direction of impingement of the received signal, and means connected to the measuring means for displaying the direction of impingement of the received signal, the improvement wherein



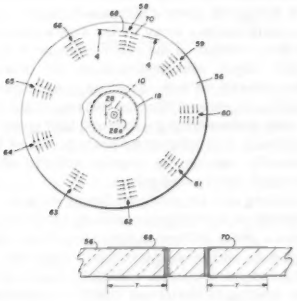
the measuring means comprises a plurality of amplifier circuits each of which includes an automatic gain control amplifier and is connected to a respective receiver for producing a constant amplitude representation of its received signal.

3,935,576

BROADBAND BEACON ANTENNA SYSTEM

Sidney Pickles, Colusa, Calif., assignor to E-Systems, Inc., Dallas, Tex.

Filed June 3, 1974, Ser. No. 476,047
Int. Cl.² H01Q 3/12; G01S 1/44
U.S. Cl. 343—761 **21 Claims**



1. An antenna system, comprising in combination:

a central radiating member arranged to transmit energy from a feed point;

a first plurality of parasitic elements radially displaced from said central member;

a support of nonradiating material having a top and bottom surface oriented generally perpendicularly to the longitudinal axis of said central member;

a second plurality of parasitic elements each element having a first section disposed to extend over the support top surface, a second section disposed to extend over the support bottom surface and an intermediate section joining the first and second sections to form therewith a long line section, said intermediate section being the only section of each element of said second plurality providing significant radiation; and

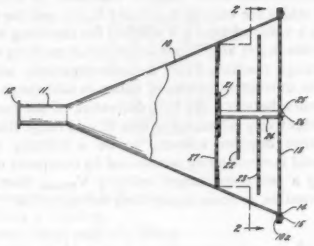
said first plurality of parasitic elements and said support disposed for rotation about said radiating member.

3,935,577

FLARED MICROWAVE HORN WITH DIELECTRIC LENS

Laurence H. Hansen, Oak Lawn, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Sept. 11, 1974, Ser. No. 504,967
Int. Cl.² H01Q 13/06
U.S. Cl. 343—781 **5 Claims**



1. In a feed horn for a dish-type microwave antenna, the combination of a flared microwave horn that introduces a phase error in microwaves passing therethrough, and a dielectric lens comprising

a plurality of parallel dielectric discs disposed concentrically with said horn in the path of microwaves passing through said horn, said discs being located within said horn so that the beam width of the microwaves radiated from the horn is substantially unaffected by the discs,

said discs having different diameters so that different portions of the microwaves pass through different numbers of said discs to compensate for the phase error introduced by the flared horn independently of the beam width,

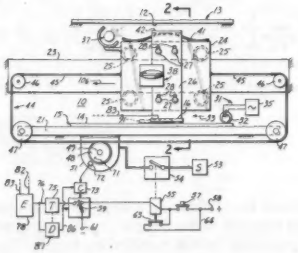
said disc being spaced apart so that the impedance discontinuities of the discs are substantially cancelled.

3,935,578

THERMO-MAGNETIC IMAGE RECORDING METHODS AND APPARATUS

John F. Condon, Sunland; Frederick J. Jeffers, Altadena, both of Calif.; Sherman W. Duck, Highland Park, Ill., and Richard C. Bachand, Glendora, Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,407
Int. Cl. G01d 15/10; G11b 5/02
U.S. Cl. 346—74.1 **11 Claims**



1. A method of recording an image of a given dimension on a magnetic medium susceptible to a local change in magnetization in response to being heated to a predetermined temperature, said method including the steps of:

placing an actuatable thermal image pattern generating device in heat transmitting proximity to at least a portion of said magnetic medium;

actuating said generating device to record on said magnetic medium a local change in magnetization according to a predetermined image pattern;

moving said generating device relative to said magnetic medium to a second position in heat transmitting proximity to said magnetic medium;

reactuating said generating device; and

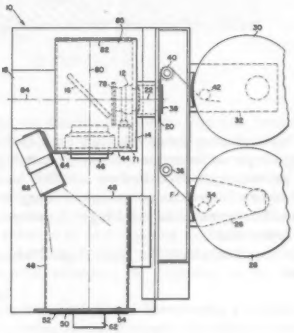
repeating said moving and reactuating steps until each elemental area of said magnetic medium within said given dimension of the image to be recorded thereon has been exposed to the heat from at least two different elemental areas of said generating device.

3,935,579

IDENTIFICATION CAMERA AND METHOD OF MAKING IDENTIFICATION CARDS

Thomas W. Bracken, Rochester, N.Y., assignor to Macro Industries, Inc., Rochester, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,891
Int. Cl.² G03B 17/24
U.S. Cl. 354—109 **6 Claims**



1. A camera for exposing photosensitive material for identification cards and the like containing a photograph of an individual and data relating to that individual, comprising

a casing having an aperture in its front wall, and a data card opening in another of its walls,

means for holding photosensitive material in said casing, and in registry with said aperture,

a first lens mounted in said casing in front of said holding means with its optical axis aligned with the center of said aperture,

a shutter movably mounted in front of said lens for movement between closed and open positions so that when said shutter is open, light from outside said casing may pass through said aperture and onto the photosensitive material,

an opaque cover mounted on said casing for movement into and out of a closed position over said data card opening,

means on said cover for removably holding over said opening in said casing, when said cover is closed, a data card containing data relating to an individual,

means for illuminating said data card,

a second lens disposed with its optical axis in the same plane as the optical axis of the first lens and optically aligned with said data card opening and with a data card held therein by said cover, and

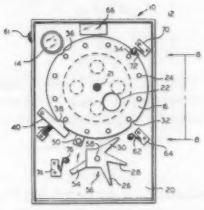
a beam splitter disposed in said casing in operative relation to both said lenses and located in alignment with said aperture, and in front of said shutter, to reflect part only of the light from the illuminated data card out of said casing along the optical axis of said first lens, and operative to transmit through said first lens and onto said photosensitive material, when said shutter is open, only part of the light entering said casing through said aperture.

3,935,580

MULTI-IMAGE CAMERA

Michael Klainos, Roselle, Ill., assignor to Identification Products Mfg. Co., Roselle, Ill.

Filed Aug. 1, 1974, Ser. No. 493,547
Int. Cl.² G03B 1/00
U.S. Cl. 354—121 **9 Claims**



1. A photographic camera for simultaneously or sequentially exposing a plurality of areas on a single sheet of photosensitive film;

said camera comprising a movable lens plate and a movable shutter plate mounted on one side of a mounting plate;

said mounting plate having a plurality of apertures extending therethrough;

said camera including means for holding said photosensitive film on the opposite side of said mounting plate;

said lens plate having at least one lens aperture therein, whereby said lens plate is movable to sequentially position each said lens aperture adjacent one of said mounting plate apertures;

said shutter plate including a plurality of apertures extending therethrough, whereby said shutter plate is movable from a first position whereby said mounting plate apertures are closed by said shutter plate, to a second position whereby said shutter plate apertures are in alignment with said mounting plate apertures;

first actuating means adapted to move said lens plate into and out of said position including first engagement means operatively connected to said lens plate;

second actuating means adapted to move said shutter plate from said first position to said second position;

power means for operating both said first and second actuating means, said power means comprising a single power source drivingly connected to a lever arm assembly to sequentially operate said first and second actuating means;

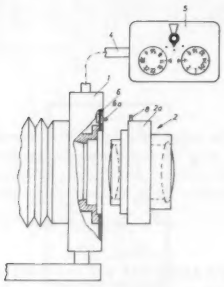
said lever arm assembly including lens operating cam means adapted to be operated by said first engagement means upon movement of said lever arm assembly by said power source to move said lens plate into and out of position to align said lens apetures with said mounting plate apertures;

whereby said power means is adapted to move said shutter plate to said second position when at least one of said lens plate apertures is in alignment with at least one of said mounting plate apertures to expose said photo-sensitive film.

3,935,581
INTERCHANGEABLE LENS ADAPTABLE TO A CAMERA OR PHOTOGRAPHIC SHUTTER, WITH BUILT-IN SECTOR SYSTEM

Franz W. R. Starp, Calmbach/Schwarzwald, Germany, assignor to Prontor-Werk Alfred Gauthier, GmbH, Calmbach, Germany

Filed Feb. 9, 1973, Ser. No. 331,263
Claims priority, application Germany, Feb. 11, 1972, 2206524
Int. Cl. G03b 9/02, 17/14
U.S. Cl. 354—270 4 Claims



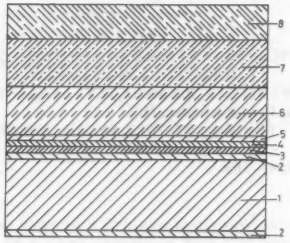
1. A camera construction having a lens mechanism having a known axis position and where the mechanism includes means for opening the lens to admit external light to the lens in one position and to blank out light to the lens in a second position selectively and which comprises an oscillating built in sector system and a plurality of independent lens systems which are selectively exchangeable one for another of a substantially like form which has a substantially like axial location and wherein the combination comprises for each drive mechanism a lens mechanism to provide a plurality of different focal lengths and apertures for the lens mechanism including a plurality of covering sectors to cover the lens axis and set the pivotal predetermined sector travel distance to cover and reveal each selected lens aperture in accordance with the sector position, a ring means carried and supported in concentric relationship to the lens axis, a support ring, a plurality of pin engaging means supported by the ring means for carrying the pivotable sectors, drive pin means located about the ring means, a drive mechanism means connected to the camera to engage the ring automatically to the drive mechanism for attaching the lens to the camera and to pivotally control the position of the covering sectors, means for engaging all lens elements of different aperture individually to the ring means and for driving the same from the said drive means, and means having a light aperture of different sizes at positions of uniform sector travel distance relative to the lens so that with a lens having a light aperture smaller than the maximum possible sector movement the excess travel distance due to diminution of the light aperture is allocated approximately equal parts to the overlap and overswing phases of the sector system as pivoted by the drive pin means and the drive pins of the ring mechanism when engaged by the drive mechanism.

3,935,582
SELENIUM RECTIFIER

John Duckles Underwood, Bishop Stortford, and David George Watts, Roydon, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 477,139
Claims priority, application United Kingdom, June 19, 1973, 28929/73
Int. Cl.² H01L 29/18
U.S. Cl. 357—11 9 Claims

1. A selenium rectifier comprising:
a metal plate base electrode;
at least one metal layer deposited on one surface of said metal plate, said metal layer consisting of a metal different than that of said metal plate;
a layer of cadmium on said metal layer;
a layer of thallium on said cadmium layer;

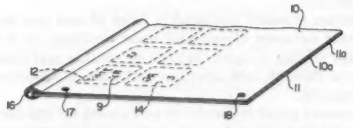


a first layer of amorphous selenium on said thallium layer;
a second layer of selenium containing a halogen additive, said second layer deposited on said first layer;
a third layer of selenium containing a halogen additive and a metallic dopant, said third layer deposited on said second layer; and
a metal counter electrode layer deposited on said third layer.

3,935,583
APPARATUS FOR MAKING MICROFICHES

Harry A. H. Spence-Bate, 115 Cheam Place, P.O. Box 8, Morley, Western Australia (6062)

Filed Mar. 22, 1974, Ser. No. 453,797
Int. Cl.² G03B 15/00
U.S. Cl. 354—292 10 Claims



1. A composite microfiche including a first lamina having an emulsion on a first surface, one or more permanent data image frames located on said first surface, a second lamina having an emulsion on a second surface, one or more updating data image frames located on said second surface, said first lamina being superimposed on said second lamina with said first surface against said second surface defining a plane, said permanent data frames being in different positions on said plane than said updating data frames, all of said images being in a substantially common focal plane and non-inverted relative to each other.

3,935,584
DEVICE FOR HANDLING PHOTOGRAPHIC FILM BETWEEN A CASSETTE AND AN EXPOSURE REPRODUCTION APPARATUS

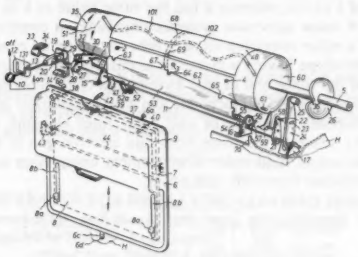
Werner Fels, Kiel, Germany, assignor to Rudolf Hell GmbH, Germany

Division of Ser. No. 335,956, Feb. 26, 1973. This application July 12, 1974, Ser. No. 488,254

Claims priority, application Germany, Feb. 29, 1972, 2209515

Int. Cl.² G03B 1/00

U.S. Cl. 354—214 **22 Claims**



1. A device for handling photographic film between a cassette and an exposure reproduction apparatus:

said cassette having a film passage access opening normally closed by a shiftable closure, and said apparatus including an enclosing housing having an access opening;

said openings being registrable with the cassette mounted in closing relation to said opening in the housing;

said cassette having therein a film supporting frame;

said apparatus including an exposure drum within said housing;

means including said frame for moving the film from the film supporting frame through the aligned openings into said housing toward said drum;

film supporting structure on said frame and said drum cooperating for transfer of the film from the frame to the drum;

said film supporting structure comprising film supporting and registration pins, with the pins of the frame being alignable with the pins on the drum; and

means for transferring the film from the frame pins onto the drum pins.

3,935,585
SEMICONDUCTOR DIODE WITH VOLTAGE-DEPENDENT CAPACITANCE

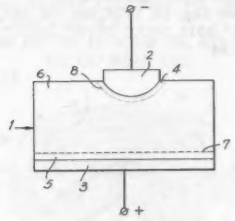
Stanislav Konstantinovich Korovin, ulitsa Zelenaya, 8., Moskovskaya oblast Domodedovo; Igor Ivanovich Kruglov, 15 Parkovaya ulitsa, 46, korpus 1, kv. 35, Moscow; Konstantin Andreevich Preobrazhentsev, ulitsa Narodnogo opolchenia, 16, korp. 3, kv. 8, Moscow; Jury Ivanovich Sidorov, Zelenograd, Korp. 503, kv. 104, Moscow, and Stanislav Vladislavovich Fronk, Sirenevy bulvar, 36, kv. 154, Moscow, all of U.S.S.R.

Continuation of Ser. No. 282,840, Aug. 22, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,983

Int. Cl.² H01L 29/92

U.S. Cl. 357—14 **3 Claims**

1. A semiconductor diode with a voltage-dependent capacitance, comprising a semiconducting crystal having two outer layers of one type of conductivity and an intermediate layer of the opposite type of conductivity disposed between said outer layers; said intermediate layer having a resistivity substantially greater than that of said outer layers, and defining therewith two P-N junctions; one of said junctions being forward-biased and the other being reverse-biased; and electrodes connected to said outer layers for serial insertion of the diode into an electric circuit; the area of said forward-biased junction being by at least twenty times greater than the area of said reverse-



biased junction; said forward-biased junction including means providing compensation for the temperature coefficient of the diode capacitance under temperature fluctuations.

3,935,586
SEMICONDUCTOR DEVICE HAVING A SCHOTTKY JUNCTION AND METHOD OF MANUFACTURING SAME

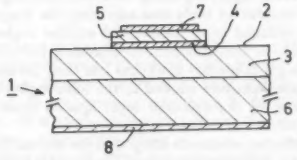
Frits Landheer, and Hermanus Josephus Henricus Wilting, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 369,988, June 14, 1973. This application Feb. 7, 1975, Ser. No. 547,997

Claims priority, application Netherlands, June 29, 1972, 7208995

Int. Cl.² H01L 29/48, 29/56

U.S. Cl. 357—15 **14 Claims**



1. A semiconductor device having a rectifying metal-to-semiconductor junction, and produced by the method comprising:

a. providing a semiconductor body having a first conductivity region adjoining a surface of said body;

b. providing a first metal layer on only the surface of said first region to form a rectifying junction;

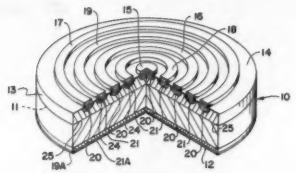
c. providing a second metal layer on said first metal layer and out of contact with said first region surface, said first and second layers comprising a layer structure, the respective said metals of said first and second layers being different from each other and being characterized by being capable of individually forming a rectifying junction with said semiconductor material of said region when disposed directly thereon, the ultimate barrier height of the junction between said first metal layer of said layer structure and said region being larger than the barrier heights of the respective junctions of said metals individually with said semiconductor material of said region; and then

d. subjecting the thus-produced assembly to a thermal treatment of at least 400°C, whereby said ultimate barrier height is attained.

3,935,587
HIGH POWER, HIGH FREQUENCY BIPOLAR TRANSISTOR WITH ALLOYED GOLD ELECTRODES

John A. Ostop; Paul M. Kisinko, both of Greensburg, Pa., and Joseph F. Henry, Palatine, Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 14, 1974, Ser. No. 497,349
Int. Cl.² H01L 29/72, 29/167, 29/207, 29/227
U.S. Cl. 357—34 10 Claims



1. A bipolar transistor with high power and high frequency capabilities comprising:

A. semiconductor body of a given conductivity-type having first and second opposed major surfaces, said body having a resistivity therethrough of between about 10 and 100 ohm-cm to form a collector region for a transistor;

B. an epitaxial semiconductor layer of conductivity type opposite from the body disposed on said first major surface of the body, said epitaxial layer having a major surface thereon, having a resistivity between about 0.5 and 10 ohm-cm and having a thickness between about 20 and 100 microns;

C. at least one emitter region and integral emitter electrode alloyed into the epitaxial layer adjacent the major surface thereof, said emitter region being of opposite conductivity type from the epitaxial layer;

D. a base region for the transistor in the interior of the epitaxial layer adjoining each emitter region and the semiconductor body and adjoining the major surface of the epitaxial layer around the emitter region, said base region in interior portions adjoining the emitter region having a minimum thickness less than 20 microns;

E. a gate electrode alloyed to the base region at the major surface of the epitaxial layer spaced from the emitter electrode and emitter region; and

F. a collector electrode alloyed to the second major surface of the semiconductor body and making ohmic contact with the semiconductor body.

3,935,588
COLOR IMAGE PICK-UP SYSTEM USING STRIP FILTER

Yoshihiro Uno, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 245,085, April 18, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,850
Claims priority, application Japan, Apr. 20, 1971, 46-25883; Apr. 20, 1971, 46-25884; Apr. 20, 1971, 46-25885
Int. Cl.² H04N 9/06
U.S. Cl. 358—44 10 Claims

1. A color television transmitter which includes a television camera tube having a photoconductive target at one end thereof, an electron gun at the other end thereof to provide an electron beam towards said target, a color strip filter positioned adjacent said target remote from said electron gun, the color strip filter being composed of a plurality of transparent strips and color strips of first and second colors, said transparent strips occurring in alternating succession between said color strips and being adapted to produce first pulses for generation of luminance signal and said color strips being adapted to produce second pulses for generation of chrominance signals upon impingement of said electron beam on said target, the improvement comprising a correcting circuit comprising:

a. means for adding successive two pulses of said first pulses and successive two pulses of said second pulses;

b. means for attenuating said added pulses by a factor of

$$\frac{1-k}{2\,(1-k)}$$

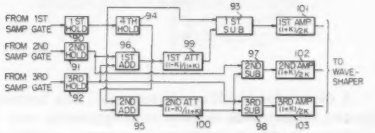
wherein k is in the range from zero to unity;

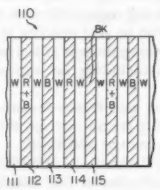
c. means for subtracting said attenuated second pulses from said first pulses and for subtracting said attenuated first pulses from said second pulses; and

d. means for amplifying said subtracting pulses by a factor of $1+k/2k$, wherein k has the same value as k in item b.

2. A color television system comprising, in combination:

(a) a color television camera tube including an evacuated envelope having a faceplate at one end, an electron gun at the other end of said envelope, a color filter element disposed on said faceplate and a photoelectrical element disposed inwardly of said color filter element, means for scanning electrons from said electron gun in a given direction, said color filter element comprising in combination therewith;





a plurality of transparent strips extending in a direction normal to said given direction to produce from said photoelectrical element upon scanning of said electrons a luminance signal;

color strips of first and second color and a blend of said first and second colors arranged in alternating succession with said transparent strips and in recurrent groups to thereby produce first and second color signals from said photoelectrical element upon scanning of said electrons thereacross; and

black strips separating each of said recurrent groups;

(b) an output impedance connected to said color camera tube; and

(c) signal processing circuit means, including color encoding means, coupled to said output impedance and responsive to an image signal appearing thereacross for developing a composite color video signal therefrom.

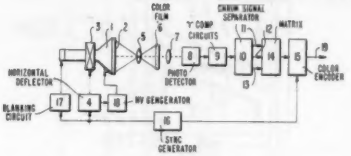
3,935,589
COLOR TELEVISION SIGNAL GENERATOR

Takahiro Ohta, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 24, 1972, Ser. No. 300,061
Claims priority, application Japan, Oct. 22, 1971, 46-83786; Oct. 22, 1971, 46-83788; Oct. 22, 1971, 46-83789
Int. Cl.² H04N 9/02
U.S. Cl. 358—54 32 Claims

1. A color television signal generator comprising: a means

for scanning a colored image area with a flying spot of light which is emitted from a cathode-ray tube whose face plate member includes a stripe layer of repetitive series of parallel different color stripes arranged in a direction crossing the scanning direction of an electron beam in said cathode-ray

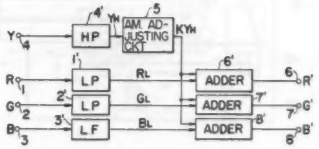


tube, said flying spot of light varying in chromaticity due to the striped layer, and a single photoelectric converter arranged to receive light from said colored image area and generating a color television signal therefrom.

3,935,590
APPARATUS FOR DISPLAYING COLORED IMAGE

Tetsunori Kaji, and Kenji Sato, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed June 20, 1974, Ser. No. 481,335
Claims priority, application Japan, June 20, 1973, 48-68779
Int. Cl.[2] H04N *9/12, 9/30*
U.S. Cl. 358—56 **6 Claims**



1. An apparatus for displaying a color image with increased resolution comprising:

first means, responsive to respective red, blue and green color representative signals, for converting said signals into respective color image component representations at the respective color areas of a color display, each respective area corresponding to one of said red, blue and green colors, said display containing a larger number of color areas for one of said colors than for the others of said colors;

second means, receiving the luminance component of a color image signal, for extracting therefrom the high-frequency luminance component of said color image signal;

third means, receiving signals representative of the respective red, blue and green components of said color image signal, for extracting the low-frequency red, blue and green color components, respectively, of said color image signal;

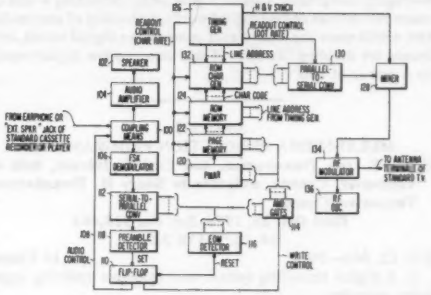
fourth means, coupled to said second and third means, for combining said high-frequency luminance component of said color image signal with the low-frequency red, blue and green color components, respectively, of said color image signal to thereby provide respective first, second and third composite color signals each of which is the sum of a respective one of the red, blue and green low frequency components and the high frequency luminance component of said color image signal; and

fifth means, coupled to said first and fourth means, for controlling the application of said first, second and third composite color signals to the respective color areas for said display in accordance with the positions of said color areas of said display.

3,935,591
AUDIO-VISUAL APPARATUS WITH CONTROL SIGNAL OPERATED GATING MEANS

Gorden Lambert Hopkins, Lake Park, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 10, 1974, Ser. No. 432,136
Int. Cl.[2] H04N *7/00*
U.S. Cl. 360—19 **6 Claims**

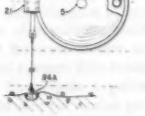


1. A recording medium having recorded thereon one or more time-division-multiplexed sequences of analog audio-information and sequences of binary-coded video information composed of first and second frequency-shift-keyed audio tones, any sequence of video information recorded on said medium being immediately preceded by a preamble code comprising a given length of a single one of the frequency-shift-keying audio tones, said given length being significantly longer than the interval of any signal component of said audio information whereby upon playback of said medium a sequence of video-information may be reliably distinguished from a preceding sequence of audio information.

3,935,592
RECORDING INSTRUMENT ADAPTED FOR USE IN REMOTE UNATTENDED LOCATIONS

John M. Dahlen, Duxbury; William E. Toth, Bolton; John T. Shillingford, Jr., Watertown, and John F. McKenna, Jr., Gloucester, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 22, 1974, Ser. No. 444,948
Int. Cl. G11b *5/09;* **G01d** *11/24*
U.S. Cl. 360—6 **7 Claims**



1. A recording instrument for use at remote locations and adapted to provide large amounts of data relating to a condition of the environment at such location, that comprises, in combination: transducer means operable to sense during relatively short intervals a condition of the environment at said

location and to produce electrical analog signals representative thereof over relatively long periods of time; an electronic data acquisition system connected to receive the electrical analog signals and to condition the analog signals and convert the same to digital words during data sampling intervals, said data acquisition system containing electronic means for averaging the digital words over said long periods of time to produce output words; a magnetic tape recorder connected to receive the digital output words from the data acquisition system and to store the same during recording intervals; a battery to power the foregoing elements; and a housing to receive and protect the foregoing elements, said means for averaging comprising a serial digital adder providing a sum of consecutive ones of said digital words, a plurality of accumulators which store the sum of said consecutive digital words, and means for dividing the sum of said consecutive digital words by a power of two.

3,935,593

MULTI-MEDIA PRODUCTION PROGRAMMER

Henry H. von Tiesenhausen, and Carl K. Iverson, both of Vancouver, Canada, assignors to Henry H. Tiesenhausen, Vancouver, Canada

Filed Oct. 29, 1974, Ser. No. 518,463

Int. Cl.² G11B *5/02*

U.S. Cl. 360—39 **15 Claims**

1. A digital recording system with selective updating capability including:

a record-playback head, said head having a signal coil and a single magnetic gap;

said signal coil being responsive to composite signals applied thereto to produce, in said gap, magnetic fields corresponding to said composite signals;

a magnetic recording medium adapted for movement over said recording head in the region of said gap;

a source of data signals;

said source of data signals including a source of "one" signals and a source of clearing signals;

a source of control signals;

said source of data signals being coupled to said source of control signals and being responsive thereto to cause the generation of a clearing signal each time a "one" data signal is generated;

and means for combining said data signals and certain of said control signals in a predetermined sequence for application to said signal coil.

3,935,594

MAGNETIC BUBBLE READ/WRITE HEAD FOR A MAGNETIC RECORDER/PLAYBACK DEVICE

Frederik Ate de Jonge, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

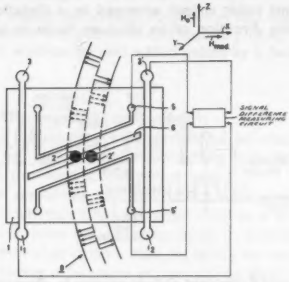
Filed Apr. 29, 1974, Ser. No. 464,786

Claims priority, application Netherlands, Feb. 28, 1974, 7402694

Int. Cl.² G11B *5/02, 21/02, 5/12*

U.S. Cl. 360—55 **11 Claims**

1. A device for storing and playing back information in a spiral track on a disk recording medium having a magnetizable material, comprising a storage and playback element in the form of a sheet of magnetizable material having an easy axis of magnetization substantially normal to the plane of said sheet, an arm means secured to said element for radially moving said sheet with respect to said disk recording medium, said sheet having a single-wall magnetic domain, magnetic field generating means for providing a magnetic field directed radially relative to said disk recording medium and having a strength which, together with the stray field of the magnetic domain emerging from said sheet is sufficient to overcome the coercive force of said magnetizable material of said recording medium, means guiding said magnetic domain for movement on said sheet, means for inverting polarity of the magnetic field from said magnetic field generating means according to a frequency modulated with an information signal to be recorded, a detector means for detecting variations in the position of the domain caused by variations in the magnetization pattern recorded on said recording medium, and means to



correct the position of said domain during playback in response to signals from said detector means.

3,935,595

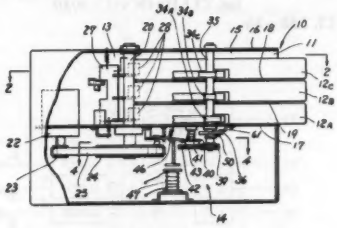
TAPE RECORDER WITH CARTRIDGE SELECTING MEANS

Toru Kondo, 2-12, Hosenji, Kashiwara, Osaka, Japan

Filed Mar. 21, 1973, Ser. No. 343,543

Int. Cl.² G11B *15/68, 15/29, 23/04*

U.S. Cl. 360—92 **1 Claim**



1. A tape recorder comprising

a. storing means for storing a plurality of endless tape cartridges in stacked condition, each of said cartridges having an endless magnetic tape, a pinch roller, and a V-shaped notch formed on a side thereof;

b. reproducing means including an elongated capstan shaft positioned near the pinch rollers of the cartridges, a plurality of magnetic heads, and an electrical circuit for controlling the play of the magnetic tape of the cartridge; and

c. selecting means for selecting the desired cartridge, said selecting means including a plurality of pressure rollers, each of the pressure rollers being positioned in one of the V-shaped notches of the cartridges, an offset cam associated with each pressure roller and adapted to press the associated pressure roller thereby pressing the pinch roller of the cartridge toward the elongated capstan shaft, each cam being securely mounted on a common shaft, a first gear mounted on said common shaft, a second gear engaging said first gear for rotation therewith, a disc mounted on the second gear so that rotation of the disc in one direction is transmitted to the second gear, an elongated arm connected to the disc and extending therefrom, a solenoid below the arm for lowering the arm, a pulley mounted on the capstan shaft and having a pin engageable with the arm when the arm is dropped by the solenoid, the arm and the disc being rotated in said one direction by the pulley when the pin engages the arm, and an electric control circuit for electrically selecting the action of the desired cam by energizing the solenoid thereby playing the desired cartridge, each of said pressure rollers being supported by an elastic rod at a free end thereof, said cams being adapted to individually press the elastic rod thereby pressing the pressure rollers.

DESIGN PATENTS

GRANTED JANUARY 27, 1976

ERRATA

For CLASS	See PATENT NO.
057–001. E	238,540
055–001. C	238,605

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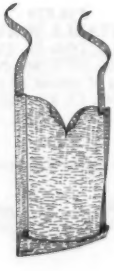
DESIGNS

JANUARY 27, 1976

238,520
WRIST SUPPORT FOR USE IN BOWLING
Norman S. Borenstein, 14431 Galy, Tustin, Calif. 92680
Filed Aug. 10, 1973, Ser. No. 387,338
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

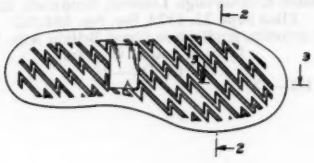
238,521
BIB
Karl Gösta Bertil Andersson, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden
Filed Mar. 22, 1974, Ser. No. 453,864
Term of patent 7 years
Int. Cl. D2—*02*
U.S. Cl. D2—229



238,522
BATHING CAP
William John Gullis, Sandwich, England, assignor to Haffenden-Richborough Limited, Sandwich, England
Filed Sept. 23, 1974, Ser. No. 508,102
Claims priority, application Great Britain Aug. 9, 1974
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—237

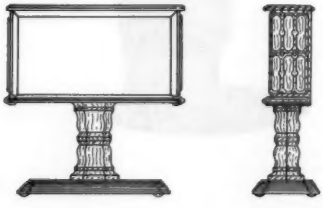
238,523
BOOT
Bradley A. Harrington, 4110 Debarr 19B, Anchorage, Alaska 99504
Filed Aug. 2, 1973, Ser. No. 385,182
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

238,524
SHOE SOLE
Jonas Senter, Greenwich, Conn., assignor to CITC Industries Inc., New York, N.Y.
Filed June 19, 1974, Ser. No. 480,882
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

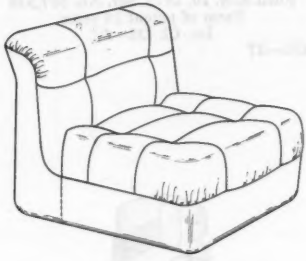


238,525
COMBINED UTILITY CASE AND KEY RING
Wayne J. Watts, Box 303, Millville, Pa. 17846
Filed Aug. 1, 1974, Ser. No. 493,925
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

238,526
SUPPORT STAND FOR A TELEVISION RECEIVER OR SIMILAR ARTICLE
Paul S. Bush, % Bush Brothers Products Corporation, 312 Fair Oak St., Little Valley, N.Y. 14755
Filed Jan. 28, 1974, Ser. No. 436,886
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—27

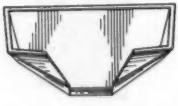


238,527
CHAIR
Charles Bernard, Montreuil-sous-Bois, France, assignor to Airborne, S.A., Montreuil-sous-Bois, France
Filed June 11, 1973, Ser. No. 369,015
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

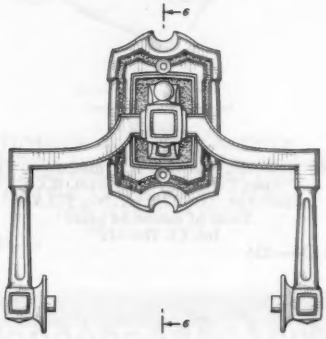


238,528
DISPLAY HOLDER
Rachel B. Crawford, P.O. Box 412, Stanwood, Wash. 98292
Filed Aug. 19, 1974, Ser. No. 498,424
Term of patent 7 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

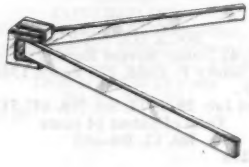
238,529
WALL MOUNTABLE SHAVER HOLDER
Richard Muller, 43 E. Ohio St., Chicago, Ill. 60611
Filed Apr. 16, 1975, Ser. No. 568,698
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—88



238,530
TOILET TISSUE HOLDER
George D. Read, Glendora, Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.
Filed Oct. 15, 1974, Ser. No. 514,824
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



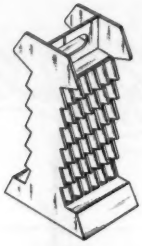
238,531
TOWEL RACK
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,497
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—99



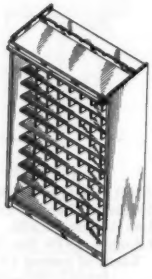
238,532
RACK FOR DISPLAYING BANANAS
Frank R. King and Geneva King, both of 2140 Mann Drive, Beech Grove, Ind. 46107
Filed Sept. 26, 1973, Ser. No. 401,027
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113

238,533
WALL MOUNT HANGING BRACKET
Drew Feldman, 3462½ Centinela Ave., Los Angeles, Calif. 90066
Filed Aug. 8, 1974, Ser. No. 495,562
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—137

238,534
DISPLAY STAND
Tony J. Bressickello, 13015 S. Normandie Blvd., Gardena, Calif. 90249
Filed Mar. 4, 1975, Ser. No. 555,177
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—188

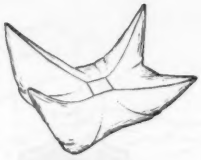


238,535
DISPLAY RACK FOR BOTTLES OR THE LIKE
Fitz Daniels, 21 St. James Place, Brooklyn, N.Y. 11205
Filed June 19, 1974, Ser. No. 480,611
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—189

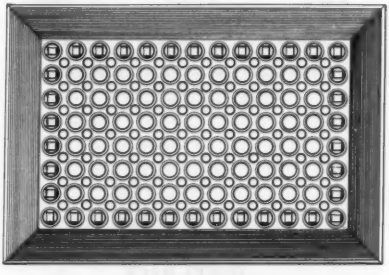


238,536
STORAGE DRAWER
Robert K. Scherzer, Liverpool, N.Y., assignor to Gaylord Bros., Inc., Liverpool, N.Y.
Filed Oct. 15, 1974, Ser. No. 514,936
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

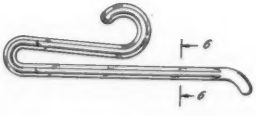
238,537
CUSHION
Eileen M. Longacre, 170 N. Sycamore Ave., Los Angeles, Calif. 90036
Filed Aug. 15, 1974, Ser. No. 497,681
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



238,538
FLOOR MAT
Waldo W. Smith, Warwick, R.I., assignor to Teknor Apex Company, Pawtucket, R.I.
Filed Apr. 28, 1975, Ser. No. 572,318
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—226

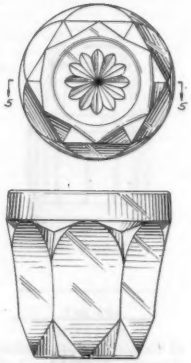


238,539
SOCK HANGER
Allen I. Field, 47 Valley Stream Road, Larchmont, N.Y. 10538, and Sidney P. Field, 226 Beach 134th St., Belle Harbor, N.Y.
Filed July 29, 1974, Ser. No. 492,512
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—251



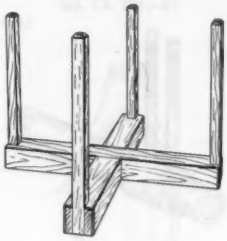
238,540
ADJUSTABLE MOUTHPIECE GUIDE CONTROL FOR MICROSURGICAL PROCEDURES
Eugene H. Holly, 3701 Broadway, West Palm Beach, Fla. 33407
Filed June 28, 1974, Ser. No. 484,147
Term of patent 7 years
Int. Cl. D16—*99*; D24—*99*
U.S. Cl. D57—1 E

238,541
TUMBLER OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Sept. 13, 1973, Ser. No. 397,069
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

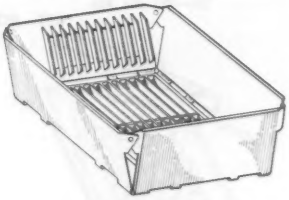


238,542
COVERED DISH
Thomas S. Shevlin, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed June 17, 1974, Ser. No. 479,807
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—18

238,543
NAPKIN HOLDER
George A. Lechner, 1064 Commercial Ave., El Centro, Calif. 92243
Filed June 5, 1974, Ser. No. 476,391
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—72



238,544
DISH DRAINER
Michael C. Wilson, Wheaton, Ill., assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Jan. 15, 1974, Ser. No. 433,552
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—188

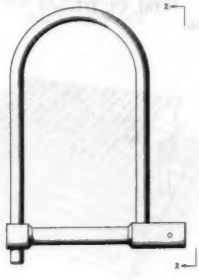


238,545
SWINGING GRATE FOR INSIDE FIREPLACE
R. Wesley Mellow, Clayton, Mo., assignor to Liberty Foundry Co.
Continuation of abandoned design application Ser. No. 230,545, Feb. 29, 1972. This application Apr. 22, 1974, Ser. No. 462,746
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—206

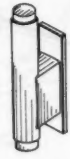
238,546
EXTRACTOR FOR REMOVING OIL BURNER SPRAY NOZZLES
Daniel Cullinane, Jr., 20 Candlewood Drive, Topsfield, Mass. 01983
Filed Oct. 1, 1973, Ser. No. 402,078
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—29

238,547
HANDLE FOR ELECTRIC SOLDERING IRON
Lawrence Emmerson House II, Baltimore, Md., assignor to The Black & Decker Manufacturing Company, Towson, Md.
Filed Jan. 30, 1974, Ser. No. 438,170
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

238,548
VEHICLE LOCK
Raymond N. Seakan, Randolph, Mass., assignor to Acro-Fab Industries, Inc., Stoughton, Mass.
Filed Dec. 20, 1974, Ser. No. 534,841
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114

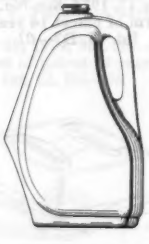


238,549
DOOR HANDLE
Jean Arnold Fischer, Hjallese, Denmark, assignor to Daempa A/S, Knarreborg, Denmark
Filed Oct. 2, 1973, Ser. No. 402,787
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—168

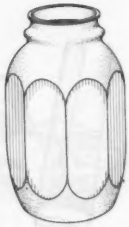


238,550
BEVERAGE CONTAINER OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 13, 1974, Ser. No. 469,209
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28

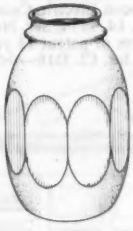
238,551
BOTTLE
Samuel J. Rivman, White Plains, N.Y., assignor to The Barcolene Company, Holbrook, Mass.
Filed May 23, 1973, Ser. No. 363,200
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—43



238,552
BEVERAGE CONTAINER OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 13, 1974, Ser. No. 469,442
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

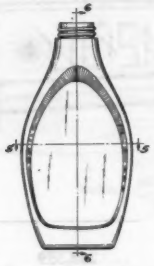


238,553
BEVERAGE CONTAINER OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 13, 1974, Ser. No. 469,272
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100



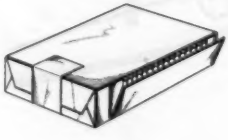
238,554
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 12, 1974, Ser. No. 496,582
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

238,555
BOTTLE OR SIMILAR ARTICLE
Elliott E. Blank, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Original design application Nov. 2, 1972, Ser. No. 303,066, which is a continuation-in-part of design application Ser. No. 232,340, Mar. 6, 1972, now abandoned. Divided and this application Sept. 24, 1974, Ser. No. 508,941
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143



238,556
ROE POUCH
Earl B. Jackson, P.O. Box 1485, Boise, Idaho 83701, and Ray Dunlap, 1903 Washington Ave., Caldwell, Idaho 83605
Filed Sept. 24, 1973, Ser. No. 399,880
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—184

238,557
COMBINED CIGARETTE AND MATCH PACKAGE
Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata-gun, Shizuoka-ken, Japan
Original design application Mar. 15, 1973, Ser. No. 341,582. Divided and this application Oct. 11, 1974, Ser. No. 514,011
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



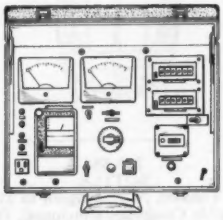
238,558
DIGITAL CLOCK
Koji Terada, Yokohama, Japan, assignor to Tamura Electric Works
Filed Feb. 25, 1974, Ser. No. 445,101
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

238,559
WRISTWATCH
Victor P. Nozdrea, 69—44 Olcott St., Forest Hills, N.Y. 11375
Filed Aug. 15, 1974, Ser. No. 497,633
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—34

238,560
CASING FOR A PORTABLE ELECTRONIC MULTIMETER
Donald P. Aupperle, Loveland, Colo., assignor to Hewlett-Packard Compnay, Palo Alto, Calif.
Filed Oct. 15, 1973, Ser. No. 406,713
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—46

238,561
CASING FOR A PORTABLE ELECTRONIC MULTIMETER
Donald P. Aupperle, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 15, 1973, Ser. No. 406,743
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—46

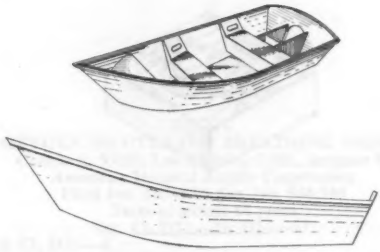
238,562
TIME TEMPERATURE ANALYZER
Joseph A. Sylvester, Wayne, N.J., assignor to Hexacon Electric Company
Filed Jan. 14, 1974, Ser. No. 433,419
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



238,563
ROAD WARNING MARKER
Howard W. Herbert, 5212 Valle Vista NW., Albuquerque, N. Mex. 87120
Filed Apr. 25, 1974, Ser. No. 463,982
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—109

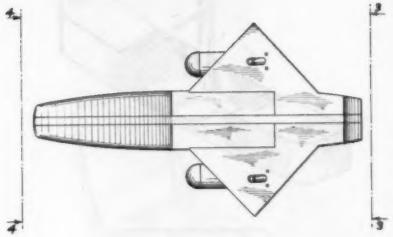
238,564
SLED
Hans G. E. Skillius, Tingsryd, Sweden, assignor to Perstorp AB, Perstorp, Sweden
Filed May 31, 1974, Ser. No. 474,961
Claims priority, application Sweden Dec. 20, 1973
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—10

238,565
DORY WITH REAR ENGINE WELL
John D. Palmer, 7702 Speedway, Everett, Wash. 98203
Filed Dec. 23, 1974, Ser. No. 535,171
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

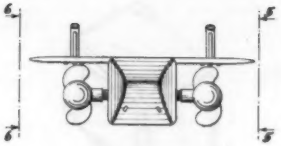


238,566
DORY
John D. Palmer, 7702 Speedway, Everett, Wash. 98203
Filed Dec. 23, 1974, Ser. No. 535,959
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

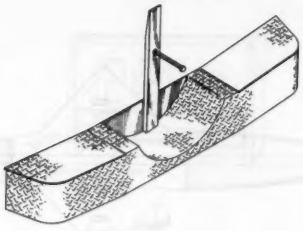
238,567
SELF-PROPELLED DIVER TOW OR THE LIKE
Wesley K. Markham, 1147 Greenridge Road, Jacksonville, Fla. 32207
Filed Jan. 15, 1975, Ser. No. 541,081
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—65



238,568
TIRE HOLDER FOR HOLDING A PNEUMATIC TIRE ON A WHEEL RIM
Borje Christer Carl-Gustav Victor, Trelleborg, Sweden, assignor to Trelleborgs Gummifabriks AB, Trelleborg, Sweden
Filed Sept. 5, 1974, Ser. No. 503,548
Claims priority, application Sweden Mar. 11, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—153

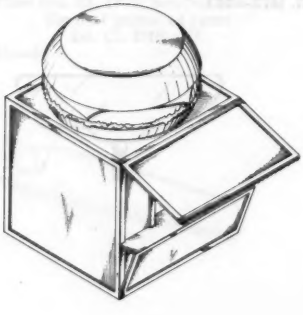


238,569
TRUCK BUMPER
Roy A. Learn, W. 4021 Indian Trail Road, Spokane, Wash. 99208
Filed Feb. 18, 1975, Ser. No. 550,857
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

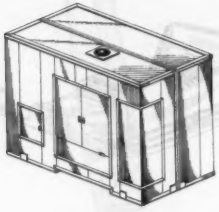


238,570
BUMPER OVERRIDER EXTENSION
John Vota, Washingtonville, and Manfred Storm, West Haverstraw, N.Y., assignors to Calibur Manufacturing Corp., West Nyack, N.N.Y.
Filed June 24, 1974, Ser. No. 482,005
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—172

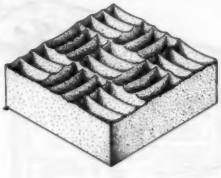
238,571
MODULAR RESTAURANT
Edward M. Laigo, Tacoma, Wash., assignor to Burger Box, Inc., Fife, Wash.
Filed Nov. 7, 1973, Ser. No. 413,556
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



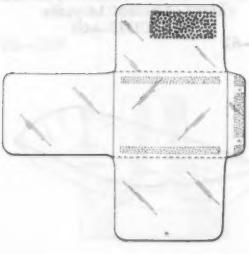
238,572
NOISE REDUCING ENCLOSURE FOR TRANSFER PRESS OR THE LIKE
Richard T. Wheeler, 20 Hemlock Drive, Vernon, Conn. 06066
Filed Feb. 28, 1974, Ser. No. 446,816
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 R



238,573
DECORATIVE ACOUSTICAL PANEL
Joseph Goldman, Minneapolis, Minn., assignor to Charles Industries Corporation, Minneapolis, Minn.
Filed Mar. 28, 1973, Ser. No. 345,579
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 B

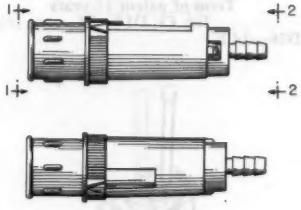


238,574
ENVELOPE
Charles S. Watson, Glen Ridge, N.J., assignor to Berlin & Jones Company. Inc., East Rutherford, N.J.
Filed Sept. 27, 1973, Ser. No. 401,202
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—3



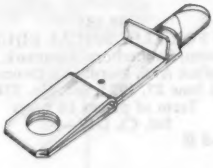
238,575
TELEPHONE LIST FINDER
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan
Filed May 30, 1974, Ser. No. 474,413
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

238,576
OXYGEN DILUTER FOR BREATHING MASKS
Claude A. Vidal, Los Angeles, Calif., assignor to American Hospital Supply Corporation
Filed Jan. 13, 1975, Ser. No. 540,389
Term of patent 14 years
Int. Cl. D23—*99*; D24—*02*
U.S. Cl. D23—4

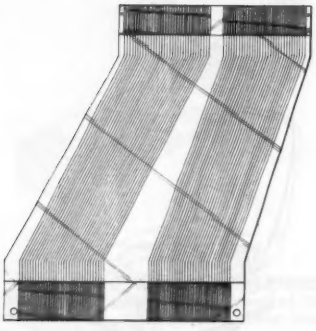


238,577
TOILET
Clifford Bruce Hewson, Toronto, Ontario, Canada, assignor to Sanitation Equipment Limited, Downsview, Ontario, Canada
Filed July 29, 1974, Ser. No. 492,959
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

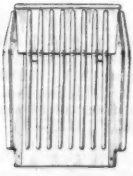
238,578
ELECTRICAL PLUG PRONG
Ben Degaetano, 1 Megan Lane, Armonk, N.Y. 10504
Filed Mar. 9, 1973, Ser. No. 339,577
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



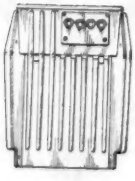
238,579
ELECTRICAL CABLE FOR GASEOUS DISCHARGE PANEL
Gerald E. Wojcik, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 7, 1974, Ser. No. 449,156
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



238,580
CASING FOR ELECTRICAL EQUIPMENT
Kjeld Lehmann, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed June 27, 1973, Ser. No. 374,255
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 R

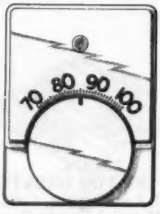


238,581
CASING FOR ELECTRICAL EQUIPMENT
Kjeld Lehmann, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed June 27, 1973, Ser. No. 374,256
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 R



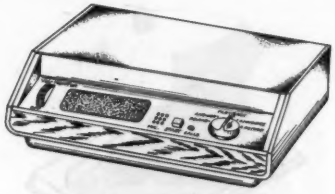
238,582
ELECTRONIC CALCULATOR
Stephen G. Hauser, Tarzana, Calif., assignor to Addmaster Corporation
Filed Feb. 24, 1975, Ser. No. 552,649
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

238,583
HEATER CONTROL
Richard H. Russell, Farmington, Conn., assignor to Safeway Products Inc., Middletown, Conn.
Filed Dec. 5, 1974, Ser. No. 529,714
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

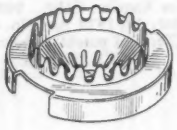


238,584
PORTABLE TWO-WAY RADIO APPARATUS OR SIMILAR ARTICLE
Arnold S. Goldman, 149 Tennessee Ave. 33312, and Donald K. Krumin, 5921 14th Terrace NE. 33316, both of Fort Lauderdale, Fla.
Filed Mar. 26, 1975, Ser. No. 562,071
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K

238,585
ELECTRONIC TELEPHONE ANSWERING UNIT
James R. Darwood, 12366 E. Charlwood, Cerritos, Calif. 90701
Filed June 21, 1974, Ser. No. 481,520
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

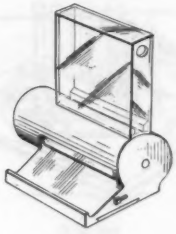


238,586
ASHTRAY COVER
Robert W. Smith, Mound, and Donald E. Wintz, St. Paul, Minn., assignors to Aladdin Manufacturing Company, Minneapolis, Minn.
Filed July 31, 1974, Ser. No. 493,248
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—13



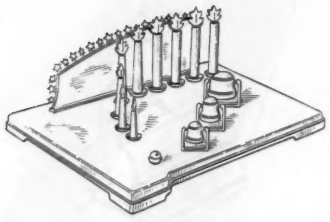
238,587
COMBINED ASHTRAY AND SIGNAL LIGHT
Colvard W. Howell, 829 E. McIntosh, Griffin, Ga. 30223
Filed Aug. 16, 1974, Ser. No. 498,086
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—15

238,588
CIGARETTE DISPENSER
Vincent Di Marzo, 1616 N. Gardiner Drive, Bay Shore, N.Y. 11706
Filed Aug. 20, 1974, Ser. No. 499,053
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D27—46

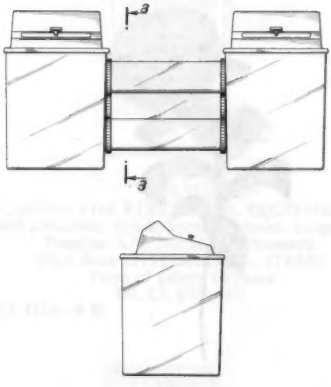


238,589
FUR FLOWER
Dawn R. Fletcher, R.R. 1, North Freedom, Wis. 53951
Filed July 2, 1973, Ser. No. 375,775
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—1 R

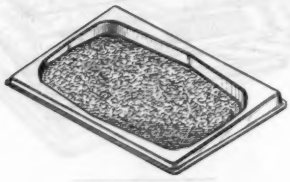
238,590
TABLE DECORATION
John R. Martindale, R.R. 1, Jordan, Lincoln, Ontario, Canada, LOR 1SO
Filed Sept. 4, 1973, Ser. No. 394,375
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 R



238,591
HOODED AQUARIUM UNIT
Robert E. De Shores, 3476 Barbara St., San Pedro, Calif. 90731, and Joseph A. Mendez, 10535 Lindenvale Road, Whittier, Calif. 90606
Filed June 17, 1974, Ser. No. 479,632
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—11

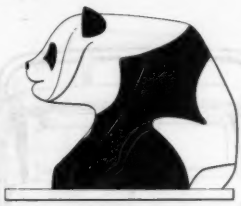


238,592
TRAY FOR HOLDING PET FEEDING BOWLS
Marvin A. Goldman, Great Neck, and Jerome N. Goldman, New York, N.Y., assignors to Penn-Plax Plastics, Inc., Garden City, N.Y.
Filed June 11, 1974, Ser. No. 478,351
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

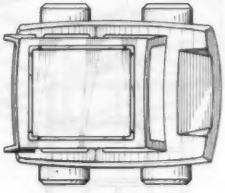


238,593
TENNIS RACKET FRAME
Alvin H. Sweet and Don A. Sweet, both of Box 72085, Los Angeles, Calif. 90002
Filed July 11, 1974, Ser. No. 487,557
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

238,594
SAVINGS BOX
Heikki Tavela, 12 Arinatie, 00370 Helsinki 37, Finland
Filed June 18, 1974, Ser. No. 480,491
Claims priority, application Finland May 2, 1974
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—11 R

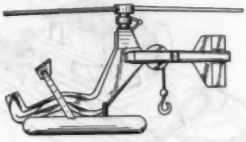


238,595
TOY VEHICLE
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345; Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316; and Dennis H. Merino, Southgate, Calif.; said Merino assignor to said Goldfarb and Benkoe
Filed Feb. 13, 1974, Ser. No. 442,136
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

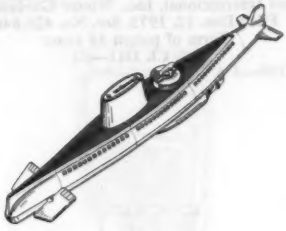


238,596
INFLATABLE KITE
Louis Lawrence Laske, Grayslake, Ill., assignor to Vonco Products, Inc., Lake Villa, Ill.
Filed May 13, 1974, Ser. No. 469,066
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AF

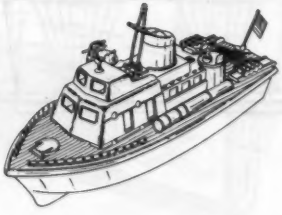
238,597
TOY HELICOPTER
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345; Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316; and Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta; and Richard D. Frierdich, Canoga Park, Calif.; said Everitt, Chesley and Frierdich assignors to said Goldfarb and Benkoe
Filed Feb. 19, 1974, Ser. No. 443,378
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 KK



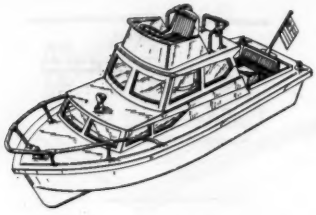
238,598
TOY SUBMARINE
Duncan Tong, Hong Kong, assignor to Playart Limited, Hong Kong
Filed June 12, 1974, Ser. No. 478,580
Claims priority, application Great Britain Dec. 20, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



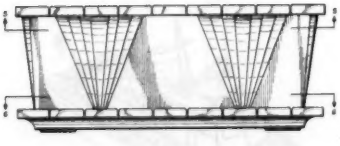
238,599
TOY BOAT
Duncan Tong, Hong Kong, assignor to Playart Limited, Hong Kong
Filed June 7, 1974, Ser. No. 477,182
Claims priority, application Great Britain Dec. 13, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



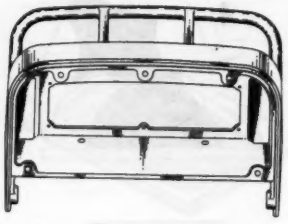
238,600
TOY BOAT
Duncan Tong, Hong Kong, assignor to Playart Limited, Hong Kong
Filed June 7, 1974, Ser. No. 477,174
Claims priority, application Great Britain Dec. 13, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



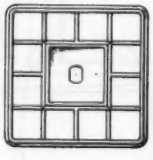
238,601
POTTED PLANT RECEPTACLE
Barnell L. Cobia, Winter Garden, Fla., assignor to Green Island International, Inc., Winter Garden, Fla.
Filed Dec. 12, 1973, Ser. No. 426,646
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



238,602
INTEGRAL COWL AND GRAB BAR FOR A TRACTOR
Arvid Harlan Saele and Michael Pier Hutton, Iowa, Iowa, assignors to Deere & Company, Moline, Ill.
Filed May 16, 1974, Ser. No. 470,377
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D40—5

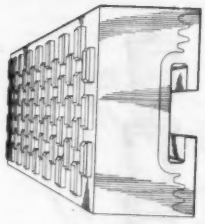


238,603
LIGHTING FIXTURE SHADE
William M. Armstrong, El Cerrito, and Wallace D. Runswick, Kensington, Calif., assignors to Inlite Corporation, Berkeley, Calif.
Filed Mar. 18, 1974, Ser. No. 452,439
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D

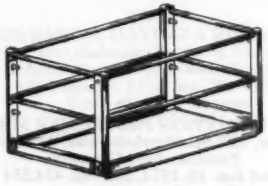


238,604
FLASHLIGHT
Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Aug. 29, 1974, Ser. No. 501,703
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

238,605
BUMPER ELEMENT FOR MOUNTING UNDERNEATH CONVEYOR BELTS OR THE LIKE
Sven-Erik Dyrup, Oxie, Sweden, assignor to Trelleborgs Gummifabriks AB
Filed Feb. 15, 1974, Ser. No. 442,949
Claims priority, application Sweden Aug. 17, 1973
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C

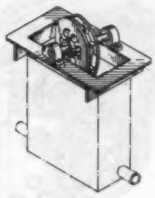


238,606
GUARD RAIL ASSEMBLY FOR SCAFFOLDING
Robert E. Cameron, Ballwin, Mo., assignor to Automatic Devices, Incorporated, Maryland Heights, Mo.
Filed Dec. 11, 1974, Ser. No. 531,530
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D54—1 A



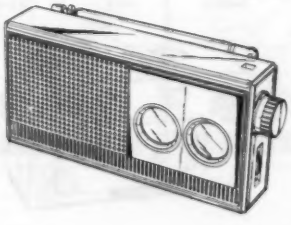
238,607
SAFETY LADDER FOR AN ABOVE THE GROUND SWIMMING POOL
Peter F. Gannon, Troy, Mich., assignor to Vinyl-Fab Industries, Ferndale, Mich.
Filed Aug. 15, 1973, Ser. No. 388,585
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D54—1 A

238,608
REVERSING CHAIN DRIVE PULLEY ASSEMBLY FOR POULTRY FEED HOPPER
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Original design application June 26, 1972, Ser. No. 266,488, now Patent No. 231,370. Divided and this application Apr. 16, 1974, Ser. No. 461,381
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C

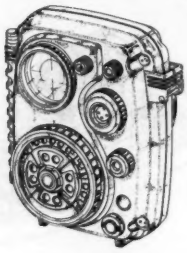


238,609
RADIO RECEIVER
Kunio Hoshino, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed July 30, 1974, Ser. No. 493,011
Claims priority, application Japan Feb. 15, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

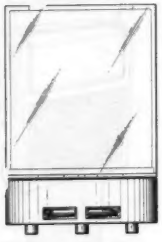
238,610
RADIO RECEIVER
Kikuo Ohta, Katano, Osaka, and Keizo Kushida, Moriguchi, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed July 30, 1974, Ser. No. 493,010
Claims priority, application Japan Feb. 15, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



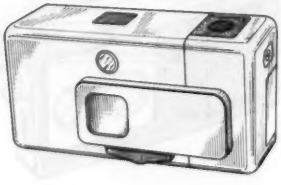
238,611
RADIO RECEIVER
Kiyoshi Fukuda, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed June 24, 1974, Ser. No. 482,167
Claims priority, application Japan Dec. 26, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



238,612
COMBINED RADIO, TISSUE DISPENSER AND PHOTO DISPLAYER
Morris Fink, Great Neck, N.Y., assignor to Windsor Industries, Inc., Plainview, N.N.Y.
Filed Aug. 29, 1973, Ser. No. 392,541
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

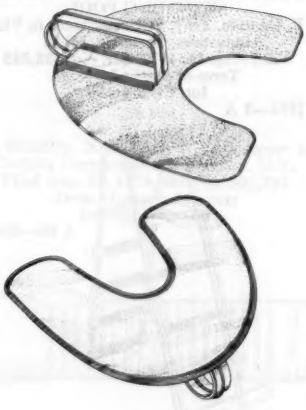


238,613
PHOTOGRAPHIC CAMERA
Heinz Waaske, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Mar. 1, 1974, Ser. No. 447,279
Claims priority, application Germany Sept. 7, 1973
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



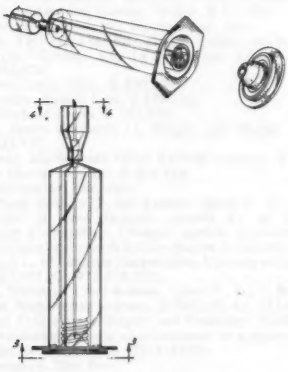
238,614
CHAIN CANDLE
Siegfried Steinhart, 14 Obere Ganshalde, 8908 Krumbach, Germany
Filed Jan. 10, 1974, Ser. No. 432,327
Claims priority, application Germany July 19, 1973
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B

238,615
X-RAY RADIATION PROTECTIVE SHIELD
Alfred Maier, 12B Schnitzschulstrasse, 8100 Garmisch-Partenkirchen, Germany
Filed Jan. 18, 1974, Ser. No. 434,554
Term of patent 14 years
Int. Cl. D24—*99*; D29—*02*
U.S. Cl. D83—1 H

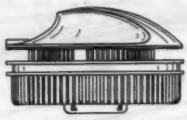


238,616
IMPLANTABLE MEDICAL-ELECTRONIC CARDIAC PACER UNIT
Howard J. Thompson, New Richmond, Wis., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Apr. 26, 1974, Ser. No. 464,486
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 F

238,617
SYRINGE BARREL HAVING A HOODED NEEDLE
Stephen Saul Richman, Evanston, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 30, 1974, Ser. No. 438,068
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—12 A

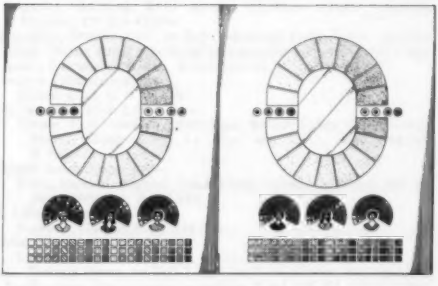


238,618
WARM-AIR BLOWER FOR A HAIR DRYER
Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed July 17, 1974, Ser. No. 489,352
Claims priority, application Switzerland Feb. 8, 1974
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

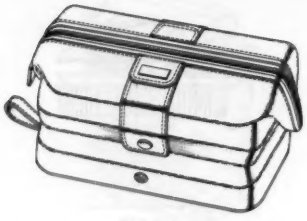


238,619
COMBINED VANITY CASE AND FINANCIAL ORGANIZER
Valerie Barad, Gardena, Calif., assignor to Theodor Manufacturing Corp., Gardena, Calif.
Filed Sept. 21, 1973, Ser. No. 399,757
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D86—10 N

238,620
COSMETICS MATCHING MIRROR
Robert C. Dorr, Woodland Hills, Calif., assignor to Ameritone Paint Corporation, Compton, Calif.
Filed June 24, 1974, Ser. No. 482,132
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 H



238,621
TRAVELING BAG
David E. Workman, Orange, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Aug. 12, 1974, Ser. No. 496,532
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 C



238,622
FABRIC ROLL CREEL FOR CLOTH FOLDING MACHINE
Herbert A. Smith, Jr., Charlotte, N.C., assignor to Golden Bear Manufacturing & Machine, Inc.
Filed Mar. 27, 1974, Ser. No. 455,418
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D92—15

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American Optical Corporation: *See—*
Cannon, Robert Lee, B 535,466.

Ampex Corporation: *See—*
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CLASSIFICATION OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED JANUARY 27, 1976

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308A	B 488,111	C	Jan. 13, 1976
309.2	B 542,158	C	Jan. 13, 1976
330.5	B 552,498	C	Jan. 13, 1976
343.3	B 536,675	C	Jan. 20, 1976
348.5L	B 521,324	C	Jan. 27, 1976
348.6	B 546,295	C	Jan. 20, 1976
471R	B 388,521	C	Jan. 13, 1976
472	B 472,256	C	Jan. 13, 1976
515A	B 390,031	C	Jan. 13, 1976
534R	B 301,143	C	Jan. 27, 1976
593R	B 468,350	C	Jan. 13, 1976
601R	B 208,916	C	Jan. 13, 1976
609E	B 474,573	C	Jan. 20, 1976
621K	B 470,348	C	Jan. 13, 1976
647	B 394,248	C	Jan. 27, 1976
674SA	B 426,274	C	Jan. 20, 1976
873	B 465,688	C	Jan. 27, 1976
Class 261			
39A	B 562,462	C	Jan. 13, 1976
98	B 480,702	C	Jan. 27, 1976
Class 264			
36	B 308,659	C	Jan. 27, 1976
51	B 508,369	C	Jan. 13, 1976
225	B 453,759	C	Jan. 27, 1976
Class 296			
35R	B 463,671	M	Jan. 13, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
232	B 540,078	E	Jan. 13, 1976
255	B 492,688	E	Jan. 20, 1976
270	B 497,960	E	Jan. 20, 1976
Class 310			
9.6	B 501,482	E	Jan. 13, 1976
41	B 561,784	E	Jan. 27, 1976
155	B 592,143	C	Jan. 25, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
273	B 531,929	E	Jan. 20, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
371	B 483,615	E	Jan. 27, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
257	B 502,973	E	Jan. 27, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 321			
2	B 533,734	E	Jan. 27, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
Class 324			
13	B 079,099	E	Jan. 13, 1976
62	B 465,393	E	Jan. 27, 1976
Class 325			
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
155	B 550,693	E	Jan. 20, 1976
Class 330			
33	B 439,542	E	Jan. 27, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5P	B 394,350	E	Jan. 13, 1976
Class 333			
30R	B 453,616	E	Jan. 27, 1976
72	B 534,991	E	Jan. 27, 1976
Class 335			
210	B 541,517	E	Jan. 13, 1976
Class 340			
172.5	B 482,907	E	Jan. 20, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
100LE	B 488,395	E	Jan. 27, 1976
100LE	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
Class 350			
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
Class 354			
298	B 489,328	E	Jan. 20, 1976
Class 357			
16	B 496,487	E	Jan. 20, 1976
65	B 470,798	E	Jan. 20, 1976
Class 358			
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
Class 403			
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
Class 415			
213R	B 512,547	M	Jan. 13, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
Class 423			
238	B 485,401	C	Jan. 27, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
580	B 379,177	C	Jan. 27, 1976
Class 424			
122	B 524,179	C	Jan. 13, 1976
230	B 487,133	C	Jan. 27, 1976
257	B 374,588	C	Jan. 27, 1976
263	B 466,929	C	Jan. 27, 1976
274	B 496,431	C	Jan. 13, 1976
311	B 457,862	C	Jan. 27, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
Class 426			
276	B 535,944	C	Jan. 13, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
70	B 381,709	C	Jan. 13, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
372	B 409,848	C	Jan. 27, 1976
389	B 519,377	C	Jan. 27, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
315	B 373,354	C	Jan. 27, 1976
434	B 457,886	C	Jan. 13, 1976
Class 431			
175	B 534,313	M	Jan. 27, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JANUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Kongsberg Vapenfabrik: *See—*
Dahl, Bjorn, 3,934,510.

Aanstad, Ola J., to Westinghouse Electric Corporation. Load control system especially adapted for a HTGR power plant turbine. 3,934,419, Cl. 60-660.000.

AB Celleco: *See—*
Rundqvist, Lars-Goran; and Jakobson, Karl Folke Olof, 3,935,109.

AB Karlshamns Oljefabriker: *See—*
Persmark, Ulf; and Stenback, Jan-Erik, 3,935,324.

AB Sundsvalls Specialprodukter: *See—*
Danielsson, Curt Aslov, 3,934,576.

Abberton, Vincent P.: *See—*
Damast, Martin A.; Abberton, Vincent P.; and Celestin, Kusler, 3,934,526.

Abdulla Essa Almannai, Ali: *See—*
Al Haj Issa, Saher, 3,934,386.

Abe, Jinnosuke; Watanabe, Tetsuo; Take, Teruo; Fujimoto, Kentaro; Fujii, Tadashiro; and Nishiie, Kazuyoshi, to Toyo Jozo Kabushiki Kaisha. Diacyl penicillins and methods for their production. 3,935,193, Cl. 260-239.100.

Accuvote, International, Inc.: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,934,793.

ACF Industries, Incorporated: *See—*
Malo, Lowell L., 3,934,785.

Acker, Jan R.: *See—*
Braton, Norman R.; and Acker, Jan R., 3,934,379.

Acme Specialty Manufacturing Company, The: *See—*
Boutin, Harold S., 3,934,807.

Acres Consulting Services Limited: *See—*
Haydock, James Livesey, 3,935,469.

Adachi, Kazuhide. Liquid fuel multistage rocket. 3,934,512, Cl. 102-49.400.

Adam, John Douglas; and Collins, Jeffrey Hamilton. Group delay equaliser. 3,935,550, Cl. 333-28.00R.

Adams, Herbert L. Powered vehicle. 3,934,669, Cl. 180-34.000.

Adaptronics, Inc.: *See—*
Cleveland, Dixon; and Derrick, Milford R., 3,935,523.

Addressograph Multigraph Corporation: *See—*
Dorfman, Michael B.; and Logan, Robert E., 3,935,361.

Adler, Alan D., to New England Institute, Inc. Photovoltaic cell with enhanced power output. 3,935,031, Cl. 136-206.000.

Adler, Franklin P., to Pullman Transport Leasing Company. Trough hatch lock device. 3,934,518, Cl. 105-377.000.

Admiral Corporation: *See—*
Cowles, Richard H.; De Franco, Thomas P.; and Maskell, Roy, 3,935,497.

Adolph Gottscho, Inc.: *See—*
Levy, Murray N.; and Gasparino, Vincent J., 3,934,506.

Aerovironment Inc.: *See—*
Lissaman, Peter B. S.; and Lambie, Jack H., 3,934,923.
MacCready, Paul B, Jr.; and Lissaman, Peter B. S., 3,934,922.

Affiliated Hospital Products, Inc.: *See—*
Juster, Robert W.; and Patton, William E., 3,934,721.

African Explosives & Chemical Industries Limited: *See—*
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Agastuma, Takashi: *See—*
Tomozawa, Akihiro; Nakata, Kensuke; Kikuchi, Akira; and Agastuma, Takashi, 3,935,083.

Agfa-Gevaert Aktiengesellschaft: *See—*
Klotzer, Sieghart; and Moisar, Erik, 3,935,014.

AGFA-GEVAERT N.V.: *See—*
Van den Bogaert, Jan, 3,935,455.

Aimoto, Kenji; Hashimoto, Shigeru; and Yoneda, Toyoaki, to Teijin Limited; and Sunstor Dentrificy Co. Ltd. Liquid or pasty dentifrice and process for preparing the same. 3,935,307, Cl. 424-56.000.

Airpax Electronics Incorporated: *See—*
Ford, Anthony R., 3,935,411.

Aisin Seiki Kabushiki Kaisha: *See—*
Hida, Takashi, 3,934,939.
Kuwana, Kazutaka; and Amano, Hiroyuki, 3,934,938.

Aizawa, Masuji, to Taihei Company Ltd. Adjustably suspended mold sections for forming a concrete room. 3,934,808, Cl. 249-27.000.

Akzona Incorporated: *See—*
Daimler, Berthold H.; Vos, Jan; and Herveling, Wilhelm, 3,934,421.

Al Haj Issa, Saher, to Al Haj Issa, Saher; and Abdulla Essa Almannai, Ali. Method for manufacturing of roofs. 3,934,386, Cl. 52-747.000.

Alagy, Jacques; Busson, Christian; and Cessou, Maurice, to Institut Francais du Petrole. Process for the treatment of waste waters containing sulfuric acid and/or ammonium sulfate. 3,935,100, Cl. 210-45.000.

Albe S.A.: *See—*
Buzzi, Ugo, 3,934,890.

Aldred, Justin Anderson, to Ilcor GmbH. Textile process. 3,934,525, Cl. 112-217.000.

Aldrich-Boranes, Inc.: *See—*
Lane, Clinton F., 3,935,280.

Aldrich, Ralph E.; and Feinleib, Julius, to Itek Corporation. Apparatus for maintaining image digitization in parallel optical digital processing systems. 3,935,441, Cl. 250-211.00R.

Alfa-Laval AB: *See—*
Revesz, Istvan, 3,934,607.
Worstorff, Hermann Heinrich Karl, 3,934,550.

Allen, Rudolph A. Ocean going cargo transport system. 3,934,531, Cl. 114-63.000.

Allied Chemical Corporation: *See—*
Jordan, James J., Jr., 3,935,226.
Prevorsek, Dusan Cyril; Kwon, Young Doo; and Sharma, Raj Kumar, 3,934,452.
Shultz, Andrew; and Wizemann, Leslie C., 3,934,973.

Allis-Chalmers Corporation: *See—*
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Allman, Richard L.; and Meurer, Vernon E., to Standard Oil Company. Meat spacer tray. 3,934,789, Cl. 229-2.500.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
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Alter, Heinz: *See—*
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Altermatt, Hans. Triazinyl vat dyestuffs. 3,935,208, Cl. 260-249.000.

Altscher, Siegfried: *See—*
Kraft, Paul; and Altscher, Siegfried, 3,935,149.

Amancharla, Amareswar; and Young, Carter R., to Otis Engineering Corporation. Well tubing system with orienting coupling means. 3,934,648, Cl. 166-116.000.

Amano, Hiroyuki: *See—*
Kuwana, Kazutaka; and Amano, Hiroyuki, 3,934,938.
Nishimura, Tokio; Yamada, Minoru; Amano, Hiroyuki; and Oishi, Yasushi, 3,935,016.

Amati, Giovanni; and Costa, Bruno. Method for measuring the flow rate of the gases coming out of an oxygen converter. 3,934,470, Cl. 73-194.00R.

Amend, Wilhelm; and Sotirovic, Toma, to Siemens Aktiengesellschaft. Locked oscillator with damped oscillatory feedback. 3,935,541, Cl. 331-4.000.

American Can Company: *See—*
McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, 3,934,743.

American Chain & Cable Company, Inc.: *See—*
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American Chemical & Refining Company, Incorporated: *See—*
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American Cyanamid Company: *See—*
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American Home Products Corporation: *See—*
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American Hospital Supply Corporation: *See—*
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Goldberg, Allan M., 3,934,722.
Rende, Richard F., 3,934,462.
Turko, Michael, 3,934,496.

American Microsystems, Inc.: *See—*
Wood, John R., 3,934,401.

American Optical Corporation: *See—*
Deeg, Emil W.; Krohn, David A.; and Graf, Robert E., 3,935,020.

American Pulverizer Company: *See—*
Graveman, Donald F., 3,934,826.
Strom, Sven B., 3,934,499.

Amey, David Anthony: *See—*
Gittos, Maurice W.; and Amey, David Anthony, 3,935,207.

Ammann, Herbert, to Sulzer Brothers Limited. Method for welding a top part and an associated bottom part. 3,934,788, Cl. 228-212.000.

Amoroso, Salvatore, Jr., to United Technologies Corporation. Single oscillator microwave transceiver. 3,935,533, Cl. 325-20.000.

AMP Incorporated: *See—*
Gilissen, Hermanus Petrus Johannes, 3,934,959.

Andco Incorporated: *See—*
Bercynski, Frank A.; Fritz, Jack J.; and Lucas, Theodore W., Jr., 3,934,523.

Anderson, Emmett R.: *See—*
McDonough, George W.; Schatz, Douglas S.; and Anderson, Emmett R., 3,935,412.

Anderson, James E.: *See—*
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Anderson, Thomas P., to Microseal Corporation. Notch and file system. 3,935,430, Cl. 235-61.12R.

Andreasen, John H.; and Howe, James A., to United States of America, Air Force. Dynamic damping apparatus. 3,935,479, Cl. 307-237.000.

Andreev, Lev Grigorievich: *See—*
Petrusenko, Dmitry Pavlovich; Andreev, Lev Grigorievich; and Epshtein, Alexandr Mikhailovich, 3,935,090.

Andreoli, Bruno, to Von Roll AG. Combustion apparatus. 3,934,521, Cl. 110-15.000.

Andrew Corporation: *See—*
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Andrulionis, Algis Steven, to Polysar Plastics, Inc. Plastic container. 3,934,749, Cl. 220-63.00R.

Anenson, David H.: *See—*
Dick, Raymond S.; and Anenson, David H., 3,934,791.

Angel, Jonathan George Cordy: *See—*
Taylor, John Thurston; Halliday, Anthony James; Angel, Jonathan George Cordy; and Blakemore, Bernard, 3,934,962.

Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich. Conveyors for piles of newspapers. 3,934,709, Cl. 198-158.000.

Anton, Nicholas G., to Eon Corporation, The. Pulsed source high-speed dry process photographic printer processor. 3,935,456, Cl. 250-316.000.

Antonini, Frank P.; and Schwalbe, Julien I. Cauterizing instrument and holder. 3,934,715, Cl. 206-223.000.

Apache Corporation: *See—*
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Apostolov, Kostadin, to Burroughs Wellcome Co. Cell lines. 3,935,066, Cl. 195-1.700.

Applied Materials, Inc.: *See—*
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Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials containing 3-anilino-5-pyrazolane couplers. 3,935,015, Cl. 96-74.000.

Ardac, Inc.: *See—*
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Arimoto, Kazuyuki; Maeda, Toshinobu; Hori, Fuzio; and Takata, Akihiko, to Matsushita Electric Industrial Co., Ltd. Phase shifting circuit. 3,935,483, Cl. 307-295.000.

Arimura, Tohru; Okado, Masaru; Ichimaru, Takarokuro; and Kamata, Masamoto, to Nippon Kokan Kabushiki Kaisha. Method of long-edge shape control for tandem rolling mill. 3,934,438, Cl. 72-9.000.

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Armstrong, Errol: *See—*
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Armstrong, Rudolph J., Jr., to Photocircuits Corporation. Improved process for preparing thermosetting laminates. 3,935,053, Cl. 156-378.000.

Arnold, Carroll H., to Wain-Roy, Inc. Tool connecting. 3,934,738, Cl. 214-145.00A.

Arnold, Cornelius Seamans, to Union Carbide Corporation. Method of oxy-fuel cutting. 3,934,818, Cl. 239-8.000.

Arnold, Richard E.: *See—*
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Aron-Samuel, Jan Marcel Didier; and Sterne, Jean Jacques, to Aron-Samuel, Jan Marcel Didier. Pharmaceutical composition containing N-(3-diethyl-aminopropyl)-4-nitro-1-oxide-pyridine-2-carboxamide and process for the treatment of hypertension therewith. 3,935,313, Cl. 424-266.000.

Arp, Leon J. Blood oxygenator. 3,934,982, Cl. 23-258.50M.

Arsac, Aime Joseph; and Tosan, Roland Jean Dominique, to Produits Chimiques Ugine Kuhlmann. Solution of ethylauramine hydrochloride in thiodiglycol. 3,934,974, Cl. 8-93.000.

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Asberg, Sture Lennart, to SKF Industrial Trading and Development Company, B.V. Cooling water pump, preferably of motor car engines. 3,934,966, Cl. 415-219.00C.

Asch, Gordon: *See—*
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Auer, William F., to Willmark Products Company. Mouth held switch assembly. 3,935,405, Cl. 200-52.00R.

Ault, Eldon F.; and Solomon, Richard A., to Dow Chemical Company, The. Apparatus for detection of chloromethyl methyl ether or bis-chloromethyl ether. 3,934,981, Cl. 23-253.00R.

Automatic Fastener Corporation: *See—*
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Avar, Lajos; and Hofer, Kurt, to Sandoz Ltd., (Sandoz AG). Novel benzothiophene derivatives as stabilizers for organic compounds. 3,935,231, Cl. 260-330.500.

Avedikian, Souren Z. Instant starting briquettes. 3,934,986, Cl. 44-6.000.

Avery, Howard William, to General Electric Company. Fluidic upstream control of the directional flow of a power jet exiting a fluidic power nozzle. 3,934,603, Cl. 137-83.000.

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Ayres, Waldemar A., to Becton, Dickinson and Company. Serum/-plasma separator with centrifugal valve. 3,935,113, Cl. 210-516.000.

Baba, Yoshio; and Kawai, Mituhiro, to Sumitomo Light Metal Industries, Ltd. Aluminum alloy of age hardening type. 3,935,007, Cl. 75-142.000.

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Baikie, Hugh E., to Kenbridge Holdings Limited. Ice skate. 3,934,892, Cl. 280-11.120.

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Baird, David Boyd; Baker, Ronald; Fishwick, Brian Ribbons; and McClelland, Robert David, to Imperial Chemical Industries Limited. Process for manufacturing heterocyclic compounds. 3,935,232, Cl. 260-332.20C.

Baker, Bernard; and Klein, Martin, to Energy Research Corporation. Method of fabricating a carbon - polytetrafluoroethylene electrode - support. 3,935,029, Cl. 136-121.000.

Baker, Jr., Bruce A.; and Springer, Willard J., to Kaiser Aluminum & Chemical Corporation. Composition control of an electrocoating bath. 3,935,085, Cl. 204-181.000.

Baker, Ronald: *See—*
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Baker, Ronald P. Rotatable transparent disc second hand for watch. 3,934,405, Cl. 58-126.00A.

Baker-Roos: *See—*
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Baker, Thomas R., to Kliklok Corporation. Vacuum pickup cup. 3,934,916, Cl. 294-64.00R.

Bakerdrill, Inc.: *See—*
Curington, Alfred R.; and Roscoe, Theodore J., Jr., 3,934,662.

Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., to Oscar Mayer & Company, Incorporated. System for offloading articles from a conveyor belt. 3,934,705, Cl. 198-32.000.

Ball Corporation: *See—*
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Ball, Herbert; and Ohl, Wolf, to International Standard Electric Corporation. Selective signal receiver for use in telecommunication systems. 3,935,395, Cl. 179-84.0VF.

Ballard, Alexander K. S. Debris collector. 3,934,390, Cl. 56-400.020.

Ballass, John T.; and Georgetti, Richard A., to Unicore, Inc. Automatic fixed position pipe welding. 3,935,414, Cl. 219-61.000.

Ballass, John T.; and Georgetti, Richard A., to Unicore, Inc. Fluxcored welding wire for gas-shielded electric arc welding. 3,935,421, Cl. 219-146.000.

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Barber, Stephen W.; and Nelson, William F., to Owens-Illinois, Inc. Luminescent device, process, composition, and article. 3,935,119, Cl. 252-301.40F.

Bardsley, William; Green, Geoffrey William; Holliday, Charles Harry; and Hurle, Donald Thomas James, to National Research Development Corporation. Weighing cell apparatus for diameter control of a rotatable growing crystal. 3,934,983, Cl. 23-273.0SP.

Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Steering arrangement for motor vehicles. 3,934,896, Cl. 280-87.00R.

Barfield, Leslie Theodore, to London & Scandanavian Metallurgical Co., Limited. Aluminum silicate particles having a layer of a rare earth oxide thereon. 3,934,988, Cl. 51-308.000.

Barnert, Konrad, to Volkswagenwerk Aktiengesellschaft. Control valve for exhaust gas recycling apparatus. 3,934,564, Cl. 123-119.00A.

Barnes, Richard D.; and Sharpe, William E., Jr., to Burlington Industries, Inc. Electrically heated laminate with a glass heating fabric. 3,935,422, Cl. 219-213.000.

Baron, Thomas Douglas; Fishwick, Brian Ribbons; Leng, John Lindley; and Yelland, Michael, to Imperial Chemical Industries Limited. Indazole-azo phenyl compounds. 3,935,183, Cl. 260-162.000.

Barringer Research Limited: *See—*
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Barry, Robert E.; and Herter, Vincent J., to Detroit Edison Company, The. Precipitation of steam fogs. 3,934,817, Cl. 239-2.00R.

Barry-Wehmiller Company: *See—*
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Barsellotti, John A.; McNeilly, Joseph H.; Laliccia, Federico R.; and Pinede, Edouard, to International Standard Electric Corporation. Key telephone system using time division and space division control. 3,935,396, Cl. 179-99.000.

Bartels, Alfred; and Kohn, Herbert, to Nordischer Maschinenbau Rud. Baader. Skinning machine for fish fillets. 3,934,310, Cl. 17-62.000.

BASF Aktiengesellschaft: *See—*
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Bauerlein, Rudolf; and Uhl, Dieter, to Siemens Aktiengesellschaft. Method of improving the radiation resistance of silicon transistors with a silicon oxide coating. 3,935,033, Cl. 148-1.500.

Baumgartner, Henri; and Meier, John G., to Battelle Memorial Institute. Boiler using combustible fluid. 3,934,555, Cl. 122-225.00R.

Baumgartner, Henri, to Battelle Memorial Institute. Boiler using combustible fluid. 3,934,556, Cl. 122-225.00R.

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Becker, Burkhardt; Wallach, Heinz; and Heise, Rainer, to Volkswagenwerk Aktiengesellschaft. Safety steering column. 3,934,486, Cl. 74-492.000.

Becker, Burkhardt, to Volkswagenwerk Aktiengesellschaft. Vehicle steering column. 3,934,487, Cl. 74-492.000.

Becker, Ignaz Albert Josef, to Rabewerk Heinrich Clausing. Semimounted two-way plow. 3,934,653, Cl. 172-212.000.

Becker, John E., to Cluaran Associates Ltd. Fluid coupling with movable vanes. 3,934,415, Cl. 60-353.000.

Becker, John Edward, to Cluaran Associates Ltd. Hydraulic coupling fluid clutches. 3,934,687, Cl. 192-3.230.

Beckers, Norman L.; and Rowe, Edward A., to Diamond Shamrock Corporation. Stabilized methyl chloroform. 3,935,287, Cl. 260-652.50R.

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Belgonucleaire: *See—*
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Bell & Howell Company: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Bellasio, Elvio, to Gruppo Lepetit, S.p.A. Aminopropanol substituted isochromanones and phthalides. 3,935,236, Cl. 260-343.20R.

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Benkoe, Erwin: *See—*
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Bennett, Richard C. Transporting system. 3,934,926, Cl. 296-35.00A.

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Bentivegna, Pasquale P. Rescue capsule for use with a helicopter. 3,934,847, Cl. 244-137.00P.

Bentley, Donald J., to Bentley Laboratories, Inc. Device for removing blood microemboli. 3,935,111, Cl. 210-446.000.

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Benton, Linda A., trust administrator: *See—*
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Beppu, Tatsuro; Iwamoto, Masami; and Sekiwa, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing a green light-emitting gallium phosphide device. 3,935,039, Cl. 148-171.000.

Bercynski, Frank A.; Fritz, Jack J.; and Lucas, Theodore W., Jr., to Andco Incorporated. Method and apparatus for removing molten waste from a furnace. 3,934,523, Cl. 110-165.00R.

Beretsky, Irwin; and Lightenstein, Bernard, to Technicon Instruments Corporation. Method and apparatus for pulse echo imaging. 3,934,458, Cl. 73-67.900.

Berg, John W. Means and method of forming sheet metal. 3,934,440, Cl. 72-54.000.

Berg Manufacturing Company, The: *See—*
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Bergeron, Michel; and Prest, Stephen Frederick, to Quebec Iron and Titanium Corporation - Fer et Titane du Quebec, Incorporated. Magnetic separation of ilmenite. 3,935,094, Cl. 209-8.000.

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Bergmeyer, Hans Ulrich; and Jaworek, Dieter, to Boehringer Mannheim G.m.b.H. Process for the conversion of glucose into gluconic acid. 3,935,071, Cl. 195-32.000.

Beriger, Ernst; Boger, Manfred; Drabek, Jozef; and Kristiansen, Odd, to Ciba-Geigy Corporation. O-methyl/ethyl-s-propyl/butyl-o-phenyl thiophosphates and dithiophosphates having an o-heterocyclic group or the phenyl ring. 3,935,233, Cl. 260-340.700.

Beringer, Monique; and Buchmann, Paul, to Tamag Basel AG. Process for the manufacture of tobacco substitute. 3,934,594, Cl. 131-2.000.

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Bernauer, Karl; Bohni, Erika; and Borgulya, Janos, to Hoffmann-La Roche Inc. Naphthoquinones. 3,935,246, Cl. 260-396.00R.

Bertele, Erhard; and Schudel, Peter, to Givaudan Corporation. Process for preparation of terpene flavorants and novel intermediates therefor. 3,935,275, Cl. 260-603.0HF.

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Bethea, Clyde G.; Levine, Barry Franklin; and Logan, Ralph Andre, to Bell Telephone Laboratories, Incorporated. Thin film liquid waveguide optical converter. 3,935,472, Cl. 307-88.300.

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Bhutani, Sudhir K., to Olin Corporation. Hydrogenation of dinitrotoluene to toluene diamine. 3,935,264, Cl. 260-580.000.

Bianchi, Joseph S. Preparation of red and rose wines. 3,935,317, Cl. 426-15.000.

Biffle, Morris S., to Dresser Industries, Inc. Rotary drilling head assembly. 3,934,887, Cl. 277-31.000.

Biola, Georges; Buathier, Bernard; Combes, Andre; and Martin, Michel, to Rhone-Poulenc Industries. Process for the manufacture of methyl mercaptan. 3,935,276, Cl. 260-609.00R.

Biornstad, Peter, to Escher Wyss GmbH. Stock inlet for a paper machine. 3,935,061, Cl. 162-252.000.

Bishop, Burton DeWolfe, to Dresser Industries, Inc. Safety latch for automotive hoists or the like. 3,934,680, Cl. 187-8.500.

Bishop, Marion M.; and Weist, Walter Robert, to Boeing Company, The. Current limiting power supply. 3,935,471, Cl. 307-32.000.

Bishton, Norris J., Jr. Oil recovery system. 3,934,275, Cl. 4-10.000.

Bivins, Henry W., Jr. Blending apparatus. 3,934,987, Cl. 48-180.00C.

Bizot, Jean; and Sausse, Andre, to Rhone-Poulenc-Textile. Purification of a chloride solution. 3,935,092, Cl. 204-234.000.

Black, Boyd C. Wire rope splice assembly. 3,934,397, Cl. 57-142.000.

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Black, Dewie E.; Fabry, Donald F.; and Dombrowski, Thaddeus, to Burroughs Corporation. Angular motion detection apparatus. 3,935,447, Cl. 250-233.000.

Black, John O. Free wing for convertible aircraft structure. 3,934,843, Cl. 244-7.00C.

Blackwell, Jennings P., to Phillips Petroleum Company. Dispersion of arylene sulfide polymer containing fluorocarbon polymer for forming coatings. 3,935,347, Cl. 427-388.000.

Blakemore, Bernard: *See—*
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Blanchard, Eugene J.; Gautreaux, Gloria A.; and Harper, Robert J., Jr., to United States of America, Agriculture. Process for preparing multicolored cotton pile fabric. 3,934,971, Cl. 8-14.000.

Blanton, Elmer Ladelle: *See—*
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Bleibtreu, Alexander; and Lauterwald, Rolf, to Maschinenfabrik Reinhausen Gebruder Scheubeck K.G. Multiphase vacuum switch assembly having cam operated spring charging drive mechanism with lost motion connection. 3,935,407, Cl. 200-144.00B.

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Blomberg, Hans: *See—*
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Blome, James C.; Goodbrake, Chris J.; O'Brien, Marvin Edward; and Vance, Macy W., to McDonnell Douglas Corporation. Fibrous insulation and process for making the same. 3,935,060, Cl. 162-152.000.

Bloomer, Ivan, to Carrier Drysys, Ltd. Paint spraying booths. 3,934,495, Cl. 98-115.0SB.

Bobene, Robert F., to Compression Dynamics, Incorporated. Apparatus and method for atomizing fuel-air mixture in a carburetion system. 3,934,569, Cl. 123-141.000.

BOC Limited: *See—*
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Boesch, Roger, to Rhone-Poulenc S.A. Insecticidal and acaricidal phenylhydrazone derivatives. 3,935,315, Cl. 424-327.000.

Boger, Manfred: *See—*
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Bohni, Erika: *See—*
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Bolen, Gerhard N.: *See—*
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Boman, Carl-Edvard F:son, to Atlas Copco Aktiebolag. Screw driver. 3,934,629, Cl. 144-32.000.

Booker, Leonard, to Detroit Edison Company, The. Coal burning system. 3,934,522, Cl. 110-22.00R.

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Bornand, Rene, to OMEGA Louis Brandt & Frere S.A. Balance wheel assembly and method for manufacture thereof. 3,934,406, Cl. 58-140.00R.

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Bouchard, Robert Thomas: *See—*
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Boulanger, Henry J.; and Brassard, Theodore, to Texas Instruments Incorporated. Current inrush limiter. 3,935,511, Cl. 317-20.000.

Bouma, Ype, to General Crane Industries Limited. Stop lock assembly for a pivotal tower. 3,934,381, Cl. 52-116.000.

Bourges, Bernard M., to Societe Anonyme: Poclain. Telescopic structure. 3,934,616, Cl. 138-113.000.

Boutin, Harold S., to Acme Specialty Manufacturing Company, The. Mirror joint assembly. 3,934,807, Cl. 248-478.000.

Bowen, Howard; and Spinner, Frederick W., to Research Technology Incorporated. Light responsive detector. 3,935,468, Cl. 250-572.000.

Bowman, Clyde L., to Rapistan Incorporated. Belt accumulators. 3,934,707, Cl. 198-34.000.

Bowman, Edward W., deceased; by Bowman, Muriel B., executrix; and by Bowman, Michael Edward, executor, to E. W. Bowman, Incorporated. Glassware handling and treating equipment. 3,934,993, Cl. 65-60.000.

Bowman, Michael Edward, executor: *See—*
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Bowman, Muriel B., executrix: *See—*
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Bracken, Thomas W., to Macro Industries, Inc. Identification camera and method of making identification cards. 3,935,579, Cl. 354-109.000.

Bradham, Allen C., to Badger Meter, Inc. Flume-type metering. 3,934,472, Cl. 73-215.000.

Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, to Bell Telephone Laboratories, Incorporated. Method for reducing rotation components in table translation. 3,934,949, Cl. 308-9.000.

Braginetz, Paul A., to Philip Morris Incorporated. Multiple blade safety razor combination. 3,934,338, Cl. 30-47.000.

Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., to Libbey-Owens-Ford Company. Sheathed thermocouple. 3,935,032, Cl. 136-230.000.

Brandi, Gabriella: *See—*
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Branecky, George N.; and Sochrin, Gary R., to Pitney-Bowes, Inc. Process and apparatus for controlling document feeding machines from indicia contained on a document fed therefrom. 3,935,429, Cl. 235-61.11E.

Brannan, Jerome A., to Dansen Company, Inc. Device for lifting, carrying and inverting water cooler bottles. 3,934,772, Cl. 224-45.0AA.

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Brassette, Donald J.; and Duncan, Richard A., to Thomson International Company. Harvesting topper. 3,934,391, Cl. 56-63.000.

Braton, Norman R.; and Acker, Jan R., to Wisconsin Alumni Research Foundation. Removal of built up layers of organic coatings. 3,934,379, Cl. 51-319.000.

Bravin, Ben. Tooth transmission member utilizing pivotally interconnected preforms. 3,934,484, Cl. 74-446.000.

Brefka, Paul, to Henry L. Hanson Co., Inc. Pilfer-proof merchandise display. 3,934,727, Cl. 211-7.000.

Brennan, Martin J.; Klawonn, Vernon D.; and Browne, Edward K., to K & B Industries, Inc. Charcoal starter. 3,934,520, Cl. 110-1.00F.

Brenneisen, Jorg; and Schonung, Arnold, to Brown, Boveri & Cie, A.G. Self-commutating inverter means. 3,935,528, Cl. 321-45.00C.

Brewer, John H.: *See—*
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Brieger, Emmet F., to Schlumberger Technology Corporation. Formation-testing apparatus. 3,934,468, Cl. 73-155.000.

Briggs, William Scott, to Georgia-Pacific Corporation. Clarification process. 3,935,101, Cl. 210-47.000.

Briles, Franklin S. Reverse end riveting system and method. 3,934,330, Cl. 29-509.000.

Brindisi, Joseph A., to Castro Convertible Corporation. Mattress compression linkage for convertible sofa-bed. 3,934,281, Cl. 5-13.000.

Brinkmann, Uwe, to International Standard Electric Corporation. Circuit arrangement for synchronizing a television receiver. 3,935,388, Cl. 178-69.5TV.

Bristoll, Paul; and Arink, Godefridus, to Shell Oil Company. Method of detecting imperfections in a heat-insulating lining. 3,934,451, Cl. 73-15.0FD.

Brockmann, Hans-Jurgen, to U.S. Philips Corporation. Device for radial, static and dynamic convergence of electron beams in a colour television display tube. 3,935,506, Cl. 315-370.000.

Brodbeck, Brunhilde. Massaging and relaxing device. 3,934,579, Cl. 128-57.000.

Brodeur, Robert R., to Morgan Construction Company. Vertical roll changing apparatus. 3,934,447, Cl. 72-239.000.

Broniwitz, Laurence E.; Landau, Mark I.; and Pearson, John B., III, to Hughes Aircraft Company. System for resolving velocity ambiguity in pulse-doppler radar. 3,935,572, Cl. 343-9.000.

Brooks, Robert E.: *See—*
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Brouwer, Geert, to U.S. Philips Corporation. Radiation detector using double amplification. 3,935,493, Cl. 313-96.000.

Brown, Boveri & Cie, A.G.: *See—*
Brenneisen, Jorg; and Schonung, Arnold, 3,935,528.

Brown, Erik, to Brown Products, Inc. Composite pad. 3,935,360, Cl. 428-186.000.

Brown Oil Tools, Inc.: *See—*
Cochran, Chudleigh B., 3,934,652.

Brown Products, Inc.: *See—*
Brown, Erik, 3,935,360.

Browne, Edward K.: *See—*
Brennan, Martin J.; Klawonn, Vernon D.; and Browne, Edward K., 3,934,520.

Bruce, Donald G., to Raymond Lee Organization, Inc., The, a part interest. Support for mannequin heads. 3,934,804, Cl. 248-229.000.

Bruggisser, Klaus; Graf, Felix; and Ruegg, Albert, to Rieter Machine Works Ltd. Traversing thread guide. 3,934,831, Cl. 242-43.000.

Bruner, A. J.; Foster, Edward T.; and Kearns, Thomas N. Barrier. 3,934,540, Cl. 116-63.00P.

Bruner, William L., to F. B. Electronics. Signal lamp configuration for directing high speed traffic and sequencing means therefor. 3,935,561, Cl. 340-109.000.

Brunov, Viktor Timofeevich: *See—*
Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,934,985.

Brunswick Corporation: *See—*
Forsgren, Lyle M., 3,934,944.

Bryant, George W., to G. M. Brooks Industries, Inc. Teaching aid for air conditioning apparatus. 3,934,356, Cl. 35-13.000.

Bryant, Robert G., to GEM Industries, Inc. Safety trip lock for the drop side of a crib. 3,934,282, Cl. 5-100.000.

Buathier, Bernard: *See—*
Biola, Georges; Buathier, Bernard; Combes, Andre; and Martin, Michel, 3,935,276.

Bucalo, Louis. Tampon device to test for micro-organisms. 3,934,575, Cl. 128-2.00W.

Buchel, Karl Heinz: *See—*
Lunkenheimer, Winfried; Buchel, Karl Heinz; and Kaspers, Helmut, 3,935,312.

Buchmann, Paul: *See—*
Beringer, Monique; and Buchmann, Paul, 3,934,594.

Buck, Robert. Contactless oscillator-type proximity sensor with constant-voltage impedance. 3,935,542, Cl. 331-65.000.

Buckeye International, Inc.: *See—*
Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan David, 3,934,934.

Buick, Douglas Stewart. Filling machines. 3,934,627, Cl. 141-146.000.

Bula, Karl. Antiskid device for vehicle tires. 3,934,633, Cl. 152-221.000.

Bulfer, Andrew Frederick, to Bell Telephone Laboratories, Incorporated. Network routing and control arrangement. 3,935,394, Cl. 179-18.0ES.

Burgen, Dering R.: *See—*
Mood, Robert D.; Hunter, Joseph P.; and Burgen, Dering R., 3,935,440.

Burk, Gerhard; and Willem, Dieter, to Daimler-Benz Aktiengesellschaft. Fastening arrangement of one sheet-metal member provided with a rim in another sheet-metal member also provided with a rim. 3,934,899, Cl. 280-152.00R.

Burkholder, Nelson D.; Wisner, Ralph L.; and Taber, Dudley A., to Dow Chemical Company, The. Absorbent product containing flocculated clay mineral aggregates. 3,935,363, Cl. 428-281.000.

Burlington Industries, Inc.: *See—*
Barnes, Richard D.; and Sharpe, William E., Jr., 3,935,422.
May, Robert Edward, 3,934,285.

Burr, John Kelsey; and Wolf, William, to Motion Systems, Inc. Recirculating ball slide. 3,934,946, Cl. 308-6.00C.

Burr, Robert P., to Kollmorgen Corporation. Displacing apparatus. 3,935,521, Cl. 318-394.000.

Burroughs Corporation: *See—*
Bagen, Herbert John; Ferguson, Ronald Worden; Korytkowski, Henry M.; and Mowry, William H., Jr., 3,934,501.
Black, Dewie E.; Fabry, Donald F.; and Dombrowski, Thaddeus, 3,935,447.
Moister, Douglas E., Jr., 3,935,508.
Morse, Robert S., 3,934,336.
Triplett: Gerald H.; Nicol, Edward A.; and Klehm, William G., Jr., 3,935,372.

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Bush, Walter Monroe: *See—*
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Lestina, Gregory James; and Bush, Walter Monroe, 3,935,263.

Buss, A.G.: *See—*
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Buss, Dennis Darcy; and Bailey, Walter Howard, to Texas Instruments Incorporated. Variable tap weight convolution filter. 3,935,439, Cl. 235-181.000.

Busson, Christian: *See—*
Alagy, Jacques; Busson, Christian; and Cessou, Maurice, 3,935,100.

Butler, Henry N. Power ventilator. 3,934,494, Cl. 98-43.000.

Butler, Lee D.: *See—*
Grey, Donald M.; and Butler, Lee D., 3,934,734.

Butts, Oscar Wesley, to Yuba Heat Transfer Corporation. Finned tube protector. 3,934,645, Cl. 165-67.000.

Buzzi, Ugo, to Albe S.A. Collet chuck which can be centered relative to one or more axes of the workpiece to be machined and suitable for machine tools. 3,934,890, Cl. 279-16.000.

Byers, Jimmy F., to United States of America, Navy. Cable traction sheave. 3,934,482, Cl. 74-230.700.

Bylo, John J. Marine transport. 3,934,532, Cl. 114-72.000.

C. Reichert Optische Werke AG: *See—*
Schindl, Klaus P., 3,935,011.

Cachat, John F., to Park-Ohio Industries, Inc. Inductor-workpiece position detector. 3,935,416, Cl. 219-10.770.

Cadman, Martyn A.; Voinov, Michel; and Tannenberger, Helmut, to Etat Francais. Electric storage battery providing high energy density. 3,935,025, Cl. 136-6.0LN.

Cairo, Anthony C.: *See—*
Bauer, Frederick T.; Cairo, Anthony C.; Holkeboer, Ronald E.; and Tyler, Gary E., 3,935,473.

Cake, Arthur F., to Wagner Electric Corporation. Multiplexed signal-sequence control system. 3,935,470, Cl. 307-105.00B.

Calcagno, Benedetto: *See—*
Cocuzza, Gioacchino; Calcagno, Benedetto; and Torreggiani, Gianni, 3,935,279.

Calderon, Nissim, to Goodyear Tire & Rubber Company, The. Process for the preparation of cyclohexadecenones and derivatives. 3,935,270, Cl. 260-586.00P.

Caldwell, Edward N., to Robertshaw Controls Company. Pneumatically operated pilot relay and system and diverting relay construction utilizing the same or the like. 3,934,613, Cl. 137-625.500.

California Cedar Products Company Inc.: *See—*
Salemme, Fred J., 3,934,628.

California Fruit Concentrates, Inc.: *See—*
Hannah, Phillip L., 3,934,497.

Calvin, Douglas G.: *See—*
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Camacho, Salvador L.; and Magor, James K. Plasma heated batch-type annealing furnace. 3,935,371, Cl. 13-2.000.

Campagna, Gary J.; and Janson, Roland C. Ocular positioning droplet dispensing device. 3,934,590, Cl. 128-233.000.

Campbell, Glenn M.: *See—*
Weiss, Verne E.; Campbell, Glenn M.; and Wilson, Gerald L., 3,935,322.

Campbell, Willis R.; and Ostergren, William F., to Sperry Rand Corporation. Breakaway mechanism for an improved crop material roll forming machine. 3,934,393, Cl. 56-341.000.

Campillo, Anthony J.; Newnam, Brian E.; Shapiro, Stanley L.; and Terrell, N. James, Jr., to United States of America, Energy Research and Development Administration. Method and apparatus for reducing diffraction-induced damage in high power laser amplifier systems. 3,935,545, Cl. 331-94.50C.

Canada-Cities Service, Ltd.: *See—*
Cymbalisty, Lubomyr M. O., 3,935,076.

Canadian Marine Drilling Ltd.: *See—*
Gallagher, John Patrick, 3,934,529.

Canazzi, H. Donald. Boat propulsion system. 3,934,538, Cl. 115-39.000.

Candlin, Francis T.; and Candlin, Michael D. Standard for parking and locking a bicycle. 3,934,436, Cl. 70-234.000.

Candlin, Michael D.: *See—*
Candlin, Francis T.; and Candlin, Michael D., 3,934,436.

Cannon, Robert B.: *See—*
Mueller, Paul; Cannon, Robert B.; and Prine, Ray A., 3,934,821.

Canon Kabushiki Kaisha: *See—*
Itoh, Susumu; Nishida, Keijiro; Kamiya, Osamu; and Sekimura, Nobuyuki, 3,934,961.

Cantley, George, to Rockwell International Corporation. Steering control head with adjustable positioning means. 3,934,488, Cl. 74-493.000.

Cap, Heinrich; Krammer, Herbert; and Scheiber, Robert, to Vockenhuber, Karl; and Hauser, Raimund. Circuit arrangement for detecting voltage differences. 3,935,524, Cl. 318-640.000.

Carder, Charles H.: *See—*
Smith, Oliver W.; Carder, Charles H.; and Trecker, David J., 3,935,330.

Carl Still, Firma: *See—*
Thiersch, Friedrich; Strobel, Manfred; and Schmitz, Theo, 3,935,078.

Carlo Erba S.p.A.: *See—*
Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, 3,935,254.

Carlson, David, Jr. Shoulder carrier for video tape machine and camera. 3,934,769, Cl. 224-5.00V.

Carlson, Elmer V.; Mostardo, August F., Jr.; and Diblick, Alex V., to Industrial Research Products, Inc. Transducer with improved armature and yoke construction. 3,935,398, Cl. 179-114.00A.

Carlson, Larry A. Carpet cutting tool. 3,934,341, Cl. 30-287.000.

Carlson, Philip E. Water and room heater. 3,934,554, Cl. 122-176.000.

Carmien, Joseph Allen, to Nupla Corporation. Assembly tool for use in attaching fiberglass tool handles. 3,935,055, Cl. 156-443.000.

Carpenter Technology Corporation: *See—*
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Carpentier, Philip E.: *See—*
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Carrico, Phillip H.: *See—*
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Carrier Corporation: *See—*
Ravicchio, Donald P.; and Geary, Carl H., 3,934,752.

Carrier Drysys, Ltd.: *See—*
Bloomer, Ivan, 3,934,495.

Carruthers, Eben H. Device for inserting and removing contact lens. 3,934,914, Cl. 294-1.0CA.

Carter, Melvin A.: *See—*
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Caruel, Jacques Emile Jules: *See—*
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Cassler, Carl D.: *See—*
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Castro Convertible Corporation: *See—*
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Catalysts and Chemicals, Inc.: *See—*
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Caton, Michael Peter Lear; Coffee, Edward Charles John; and Watkins, Gordon Leonard, to May & Baker Limited. Cyclopentane derivatives. 3,935,261, Cl. 260-557.00R.

Cavitron Corporation: *See—*
Damast, Martin A.; Abberton, Vincent P.; and Celestin, Kusler, 3,934,526.

Cawley, John Duval, to Eastman Kodak Company. Block copolyesters of polysiloxanes. 3,935,154, Cl. 260-33.8SB.

Celestin, Kusler: *See—*
Damast, Martin A.; Abberton, Vincent P.; and Celestin, Kusler, 3,934,526.

Cengel, John A.: *See—*
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CERPHA: *See—*
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Cessou, Maurice: *See—*
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Chagra, Lee A.: *See—*
Crepinsek, Alois, 3,934,437.

Challenge-Cook Bros., Incorporated: *See—*
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Chambers, Arnold, to Glass Tubes and Components Limited. Object transfer machine. 3,934,732, Cl. 214-1.0BB.

Chambers, Arnold: *See—*
Inns, David Harold; Bennett, william Roy; and Chambers, Arnold, 3,934,997.

Chambers, Robert L. Disk record player. 3,934,883, Cl. 274-9.00B.

Chapurlat, Robert, to Rhone-Poulenc S.A. Process for the oxidation of olefine compounds. 3,935,272, Cl. 260-597.00R.

Chasovodov, Nikolai Alexandrovich: *See—*
Egorov, Jury Dmitrievich; Kavyarov, Ivan Savvateevich; Samatov, Jury Petrovich; Chasovodov, Nikolai Alexandrovich; and Chirikhin, Jury Ivanovich, 3,934,665.

Cheetham, Ian: *See—*
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Chemcut Corporation: *See—*
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Chemed Corporation: *See—*
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Chemetron Corporation: *See—*
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Chen, Ming Chih: *See—*
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Cheng, King Y.: *See—*
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Chernysheva, Evangelina Mikhailovna: *See—*
Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,934,985.

Chevron Oil Field Research Co.: *See—*
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Chibata, Ichiro; Tosa, Tetsuya; and Matuo, Yuhsi, to Tanabe Seiyaku Co., Ltd. Purification of coenzyme A. 3,935,072, Cl. 195-68.000.

Chicago Display Company: *See—*
Snyder, Alan Kent; Schmidt, Arthur D.; Foote, Seldon T., deceased; and Clipp, Robert R., executor, 3,934,702.

Chielens, Alain, to Fives-Cail Babcock. Cooling arrangement for continuously cast metal objects. 3,934,641, Cl. 164-283.00S.

Chilcott, Lloyd D.: *See—*
Smith, Paul E., Jr.; and Chilcott, Lloyd D., 3,934,796.

Childers, Clifford W.; Clark, Earl; and Johnson, Wallace D., to Phillips Petroleum Company. Preparation of impact plastic compositions. 3,935,136, Cl. 260-4.00R.

Childers, Clifford W.; and Clark, Earl, to Phillips Petroleum Company. Recovery and recycle of latex produced in used aqueous suspension medium. 3,935,148, Cl. 260-29.6XA.

Childs, George William, deceased: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,934,793.
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Childs, Patricia M., executrix: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,934,793.
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,935,426.

Chinnock, Edwin Leroy; Gloge, Detlef Christoph; and Smith, Peter William, to Bell Telephone Laboratories, Incorporated. Method for breaking brittle rods or fibers. 3,934,773, Cl. 225-2.000.

Chirikhin, Jury Ivanovich: *See—*
Egorov, Jury Dmitrievich; Kavyarov, Ivan Savvateevich; Samatov, Jury Petrovich; Chasovodov, Nikolai Alexandrovich; and Chirikhin, Jury Ivanovich, 3,934,665.

Chiu, Herman S.; and Rasmussen, Jerome J. M., to Union Carbide Corporation. Tubular cellulosic casing with cationic thermosetting resin coating. 3,935,320, Cl. 426-105.000.

Chokshi, Vibhas: *See—*
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, 3,934,972.

Christensen, James L.: *See—*
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Chromax Limited: *See—*
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Church, Ralph E.; and Beckman, Daniel L., to General Electric Company. Dynamoelectric machine having improved vibration isolation and thrust system. 3,935,489, Cl. 310-90.000.

Churchill, John W. Method of constructing bilateral heater unit. 3,934,333, Cl. 29-611.000.

Ciaperoni, Aldemaro; and Mattiussi, Andrea, to Montedison S.p.A. Process for the anionic polymerization of pyrrolidone. 3,935,171, Cl. 260-78.00P.

Ciba-Geigy Corporation: *See—*
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Dazzi, Joachim; Kirchmayr, Rudolf; and Dietrich, Henri, 3,935,251.
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Cicognani, Mario, to Industrie Pirelli S.p.A. Mold for making double-toothed belts. 3,934,968, Cl. 425-28.00B.

Cielaszyk, Edward F.; DeRose, Ralph A.; and Kravcik, John W., to Neptune International Corporation. Electromagnetically operated remote meter or register having counter wheel locking means. 3,935,433, Cl. 235-92.00C.

Cimarusti, Christopher M.: *See—*
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Citizen Watch Co., Ltd.: *See—*
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Clark, Earl: *See—*
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Childers, Clifford W.; and Clark, Earl, 3,935,148.

Clark Equipment Company: *See—*
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Clark, Jack Phillip; Smith, Thurman Dale; and Foster, Alan Carl, to General Electric Company. Vessel nozzle inspection apparatus. 3,934,457, Cl. 73-67.80S.

Clarke, Geoffrey, to Square D Company. Ground fault protective system including an impedance responsive oscillator. 3,935,510, Cl. 317-18.00D.

Cleaver, Kenneth E., to American Hospital Supply Corporation. Reagent and method for determining total calcium in body fluids. 3,934,977, Cl. 23-230.00B.

Cleon Corporation: *See—*
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Cleveland, Dixon; and Derrick, Milford R., to Adaptronics, Inc. Non-minimum phase linear controller for hydraulic mechanisms. 3,935,523, Cl. 318-609.000.

Clipp, Robert R., executor: *See—*
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Cluaran Associates Ltd.: *See—*
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Coates, Thomas L.: *See—*
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Cochran, Chudleigh B., to Brown Oil Tools, Inc. Apparatus and method for cementing well liners. 3,934,652, Cl. 166-285.000.

Cockle, Roy R. Method and apparatus for producing rough cut lumber. 3,934,630, Cl. 144-39.000.

Cocuzza, Gioacchino; Calcagno, Benedetto; and Torreggiani, Gianni, to Societa'Italiana Resine S.I.R. S.p.A. Process for the production of glycol ethers. 3,935,279, Cl. 260-615.00R.

Coffee, Edward Charles John: *See—*
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Cohen, William A., to Sphero International Company. Anti-pollutant spherical rotary engine with automatic supercharger. 3,934,559, Cl. 123-8.450.

Colafati, Ralph A., III: *See—*
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Colgate, Paul Alexander: *See—*
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Collier, David Thomas, to Hawker Siddeley Dynamics Limited. Optical scanning systems. 3,935,448, Cl. 250-236.000.

Collins, Jeffrey Hamilton: *See—*
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Colourvision Associates: *See—*
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Columbia Pictures Industries, Inc.: *See—*
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Combes, Andre: *See—*
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Combustion Engineering, Inc.: *See—*
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Commissariat a l'Energie Atomique: *See—*
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Compagnie Electro Mecanique: *See—*
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Compagnie Generale d'Electricite: *See—*
Godard, Bruno; Lacour, Bernard; and Gaffard, Jean-Paul, 3,935,544.

Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See—*
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Compression Dynamics, Incorporated: *See—*
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Concast AG: *See—*
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Condon, John F.; Jeffers, Frederick J.; Duck, Sherman W.; and Bachand, Richard C., to Eastman Kodak Company. Thermo-magnetic image recording methods and apparatus. 3,935,578, Cl. 346-74.100.

Cone, Richard E., II: *See—*
Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan David, 3,934,934.

Conger, Marvin T.; Evans, Theodore A.; and Villemain, Herbert F., to Goodyear Tire & Rubber Company, The. Method of making a fuel cell. 3,935,050, Cl. 156-242.000.

Consales, Emanuel J.: *See—*
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Construction Materials Division General Electric Company: *See—*
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Container Corporation of America: *See—*
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Container Graphics Corporation: *See—*
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Continental Can Company, Inc.: *See—*
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Continental Industries, Inc.: *See—*
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Controls Southeast, Inc.: *See—*
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Henderson, James R., 3,934,618.

Conway, John E., to Universal Oil Products Company. Method of catalyst manufacture. 3,935,127, Cl. 252-465.000.

Cooke, Claude E., Jr., to Exxon Production Research Company. Method for coating particulate material thereof. 3,935,339, Cl. 427-216.000.

Cooper, Leland L.; and Beer, Darl L., to Du-Co Ceramics Company. Ceramic insulator for supporting a ribbon-type heating element. 3,935,376, Cl. 174-138.00J.

Cordle, Paul E.; and McCubbin, Melvin J., to United States of America, Navy. Linear shaped charge warhead. 3,934,511, Cl. 102-24.0HC.

Cordon, Martin: *See—*
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Corio, Nicholas N. Balling gun. 3,934,584, Cl. 128-223.000.

Cornell, Stephen Watson: *See—*
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Cornils, Boy: *See—*
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Coski, William D.: *See—*
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Costa, Bruno: *See—*
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Costes, Jean-Raymond: *See—*
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Cotterrell, Graham Paul, to Imperial Chemical Industries Limited. Pesticidal substituted 2-hydroxylaminopyrimidinyl phosphorus esters. 3,935,212, Cl. 260-256.40E.

Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Phenolic antioxidants prepared from a pentacyclo-tetradeca-5,11-diene. 3,935,281, Cl. 260-619.00B.

Coucher, Robert G. Novel way system. 3,934,829, Cl. 241-259.100.

Coulson, Derrick; and Coyle, John C., to Rolls-Royce Motors Limited. Vehicle air conditioning system. 3,934,642, Cl. 165-23.000.

Cournut, Rene, to Apamed Anstalt. Chemically acting intra-uterine device. 3,934,580, Cl. 128-130.000.

Coutant, Ralph W., to Litton Systems Inc. Keeper for idler rolls. 3,934,711, Cl. 198-192.00R.

Coutta, John M. Surveillance system. 3,935,380, Cl. 178-6.800.

Couvillion, Claude C. Teaching method and apparatus. 3,934,357, Cl. 35-31.00G.

Cowles, Richard H.; De Franco, Thomas P.; and Maskell, Roy, to Admiral Corporation. Shadow mask thermal compensating assembly. 3,935,497, Cl. 313-405.000.

Coyle, John C.: *See—*
Coulson, Derrick; and Coyle, John C., 3,934,642.

CPC International Inc.: *See—*
Suekane, Mikio; Hasegawa, Shiro; Tamura, Masaki; and Ishikawa, Yoshiyuki, 3,935,070.

Crane Co.: *See—*
Schrock, Donald C., 3,934,278.

Crepinsek, Alois, to Crepinsek, Alois; Chagra, Lee A.; and McFadden, Dafe. Door bolt lock. 3,934,437, Cl. 70-370.000.

Creusot-Loire: *See—*
Morlet, Jean Georges Marie, 3,934,864.

Crill, Kay C.: *See—*
Eguchi, Ronald G.; Mann, Michael M.; Lacina, William B.; and Crill, Kay C., 3,935,543.

Crommentuyn, Gerardus J.; and Kuiper, Johannes H. A., to Oce-van der Grinten N.V. Electrophotographic reproduction element of an aniline compound electron acceptor. 3,935,009, Cl. 96-1.500.

Cross Europa-Werk GmbH: *See*—
Schubert, Paul; and Treipl, Hans, 3,934,700.

Cross, John W.: *See*—
Schwartz, Daniel M.; and Cross, John W., 3,934,667.

Crounse, Nathan N., to Sterling Drug Inc. 4,4'-Stilbenebis-pyridooxazoles and related optical brighteners and polymeric compositions brightened thereby. 3,935,195, Cl. 260-240.0CA.

Crounse, Nathan N.: *See*—
Jefferies, Patrick J.; and Crounse, Nathan N., 3,935,182.

Crown Zellerbach Corporation: *See*—
Rucker, George I., 3,935,048.

Cruden, John L., Jr. Apparatus for forming piped openings in a garment. 3,934,776, Cl. 227-76.000.

Cryor, Elliott C. Coin counting and wrapping aid. 3,934,389, Cl. 53-213.000.

Culver, Irven H., to Southwestern Industries, Inc. Roll stabilizer for a boat. 3,934,535, Cl. 114-124.000.

Cumpston, Edward H., Jr. Method and apparatus for silo storage and unloading. 3,934,737, Cl. 214-16.00R.

Curington, Alfred R.; and Roscoe, Theodore J., Jr., to Bakerdrill, Inc. Core bit. 3,934,662, Cl. 175-405.000.

Curry, John Joseph, to Illinois Tool Works Inc. Closure assembly. 3,934,744, Cl. 215-219.000.

Curry, Willie A., to Fanguy, Jude Thaddeus, a part interest. Resistance sensing free-point tool. 3,934,466, Cl. 73-151.000.

Curtis Noll Corporation: *See*—
Lieptz, Nathan S., 3,934,679.

Curtiss, Alan C., to Pfizer Inc. Disc dispenser with removable magazines. 3,934,753, Cl. 221-93.000.

Curtiss, Frank E.; and Curtiss, Jack E. Horseshoe target posts. 3,934,879, Cl. 273-104.000.

Curtiss, Jack E.: *See*—
Curtiss, Frank E.; and Curtiss, Jack E., 3,934,879.

Cushman, Robert Holbrook; and Schenk, Raymond L., Jr., to Gould Inc. Method and apparatus for locating and locking onto workpieces in positive displacement casting. 3,934,782, Cl. 228-51.000.

Cushman, Walton W., to Romanski, Lon H. Transportation system. 3,934,515, Cl. 104-18.000.

Custom Mechanical Contractors, Inc.: *See*—
Morris, Herman H., 3,934,425.

Cymbalisty, Lubomyr M. O., to Canada-Cities Service, Ltd.; Atlantic Richfield Canada Ltd.; and Gulf Oil Canada Ltd. Two stage separation system. 3,935,076, Cl. 196-14.520.

Czerniak, Leonard C. Permanent magnet motor. 3,935,487, Cl. 310-46.000.

Czirr, David L.; and Kroll, Harry, to Philip A. Hunt Chemical Corporation. Nitric acid system for etching magnesium plates. 3,935,118, Cl. 252-79.400.

Dahl, Bjorn, to A/S Kongsberg Vapenfabrik. Proximity fuse. 3,934,510, Cl. 102-70.20P.

Dahlen, John M.; Toth, William E.; Shillingford, John T., Jr.; and McKenna, John F., Jr., to Massachusetts Institute of Technology. Recording instrument adapted for use in remote unattended locations. 3,935,592, Cl. 360-6.000.

Dahlen, Sven Erik; Ekstrom, Bertil Ake; Kovacs, Odon Kalman Jozsef; and Sjoberg, Berndt Olof Harald, to Astra Lakemedel Aktiebolag. Cephalosporin and pharmaceutical preparations containing the same. 3,935,204, Cl. 424-246.000.

Daicel Ltd.: *See*—
Hozumi, Yukio; Ohi, Akira; and Imai, Tatuhiko, 3,935,152.
Kudo, Teizo; Hashizume, Yoshio; Mikumo, Masatoshi; and Itoh, Masanori, 3,935,153.
Takahashi, Sakae; Saeki, Shiro; and Onisawa, Yoshio, 3,935,143.

Daimler-Benz Aktiengesellschaft: *See*—
Barenyi, Bela, 3,934,896.
Burk, Gerhard; and Willem, Dieter, 3,934,899.
Hutai, Hubert; and Fischer, Wolfgang, 3,934,913.
Merkle, Hans; and Frotschner, Eberhard, 3,934,414.

Daimler, Berthold H.; Vos, Jan; and Herveling, Wilhelm, to Akzona Incorporated. Ground stabilization matting. 3,934,421, Cl. 61-35.000.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Kaneko, Hidehiko; Aritomi, Jiro; and Yamato, Yuzuru, deceased, 3,935,268.

Daly, Noel. Method of manufacturing improved protective headgear. 3,935,044, Cl. 156-79.000.

Damast, Martin A.; Abberton, Vincent P.; and Celestin, Kusler, to Cavitron Corporation. Ultrasonic cutting apparatus. 3,934,526, Cl. 112-252.000.

D'Amico, Paul M. Floatable tow-line holder. 3,934,838, Cl. 242-85.100.

Dandini, Alessandro O. Spherical system for the concentration and extraction of solar energy. 3,934,573, Cl. 126-270.000.

Danfoss A/S: *See*—
Jespersen, Hans Jorgen; and Nielsen, Leif, 3,934,426.
Thun, Niels, 3,935,385.

Danielson, Irvin R., to Thor Power Tool Company. Dual safety control means for a power tool. 3,934,657, Cl. 173-169.000.

Danielsson, Curt Aslov, to AB Sundsvalls Specialprodukter. Central venous catheter system. 3,934,576, Cl. 128-2.05D.

Dansen Company, Inc.: *See*—
Brannan, Jerome A., 3,934,772.

Darlington, William B.: *See*—
Du Bois, Donald W.; and Darlington, William B., 3,935,350.

Dart Industries Inc.: *See*—
Fein, Marvin Michael; Colgate, Paul Alexander; and Kent, Ronald Allan, 3,935,128.

Davidsohn, Alfred, to Marni S.A. Method of sulfonation of aromatic hydrocarbons with minimized by-product formation. 3,935,237, Cl. 260-505.00E.

Davidson, James R., to Xerox Corporation. Transfer apparatus. 3,934,549, Cl. 118-637.000.

Davis, James L., to H. H. Robertson Company. Closure seal member and fixed frame assembly utilizing the same. 3,934,384, Cl. 52-397.000.

Davis, Stephen U.: *See*—
Stand, Mille; and Davis, Stephen U., 3,935,418.

Davydov, Anatoly Borisovich: *See*—
Khromov, Gennady Lvovich; Davydov, Anatoly Borisovich; Maichuk, Jury Fedorovich; and Tischina, Inna Fedorovna, 3,935,303.

Dawidowicz, Jan; and Ferraro, Frank A., to Warner-Lambert Company. Razor blade cartridge. 3,934,339, Cl. 30-47.000.

Dawkins, Maxwell John, to ICI Australia Limited. Firing devices and processes. 3,934,514, Cl. 102-70.20R.

Dazey Products Co.: *See*—
McNair, Samuel L., 3,934,597.

Dazzi, Joachim; Kirchmayr, Rudolf; and Dietrich, Henri, to Ciba-Geigy Corporation. 2,4,8-Trichloro-tri and tetra bromodibenzofurans. 3,935,251, Cl. 260-346.20M.

Dean, George A., to Dean Research Corporation. Accumulator. 3,934,871, Cl. 271-184.000.

Dean Research Corporation: *See*—
Dean, George A., 3,934,871.

Dear, Robert Ernest Arthur; and Falk, Robert Allan, to Ciba-Geigy Corporation. New R_f-glycols containing two perfluoroalkylthio groups and useful compositions therefrom. 3,935,277, Cl. 260-609.00R.

DeBaun, Earl A. Turbine engine. 3,934,418, Cl. 60-624.000.

Debrunner, Kurt: *See*—
Hess, Johann T.; Debrunner, Kurt; and Tan, Aujit, 3,934,324.

Decibel Products, Inc.: *See*—
Jachowski, Ronald E., 3,935,549.

Decker, Jurgen: *See*—
Muller, Rudolf; and Decker, Jurgen, 3,934,563.

de Cleur, Eckhard: *See*—
Wingler, Frank; Pedain, Josef; Muller, Richard; Dhein, Rolf; and de Cleur, Eckhard, 3,935,138.

Deeg, Emil W.; Krohn, David A.; and Graf, Robert E., to American Optical Corporation. Faraday rotation glasses. 3,935,020, Cl. 106-54.000.

Deep Oil Technology, Inc.: *See*—
Horton, Edward E.; Brewer, John H.; Silcox, William H.; and Hudson, T. A., 3,934,528.

De Franco, Thomas P.: *See*—
Cowles, Richard H.; De Franco, Thomas P.; and Maskell, Roy, 3,935,497.

de Jonge, Frederik Ate, to U.S. Philips Corporation. Magnetic bubble read/write head for a magnetic recorder/playback device. 3,935,594, Cl. 360-55.000.

Delaney, Thomas James; and Pierson, William Grant, to Colgate-Palmolive Company. Toothpaste. 3,935,305, Cl. 424-49.000.

Delavan Manufacturing Corporation: *See*—
Reed, Kenneth E., 3,934,823.

Delfosse, Pierre; and Bosshard, Alfred, to Pluss-Staufer AG. Process for the wet grinding of materials. 3,934,825, Cl. 241-16.000.

De Longueville, Bernard: *See*—
Lambert, Emmanuel; Lambert, Jean-Louis; and De Longueville, Bernard, 3,935,419.

de Luca, Peter C.; Stoddart, Hugh F.; and Jeffries, David, to Cleon Corporation. Whole body imaging. 3,935,462, Cl. 250-369.000.

Del Val, Sagrario Mochales: *See*—
Hendlin, David; Mata, Justo Martinez; Del Val, Sagrario Mochales; and Stapley, Edward O., 3,935,309.

Demillecamps, Edmond; and Orban, Andre, to Solvay & Cie. Plastics compositions based on polyvinylidene fluoride. 3,935,159, Cl. 260-42.270.

Dennison, Clifford C. Automatic water distiller. 3,935,077, Cl. 202-83.000.

Dent, Gilbert. Fastener driving tool. 3,934,779, Cl. 227-147.000.

Dentsply Research & Development Corporation: *See*—
Johnson, Philip C., 3,934,928.

de Radzitzky d'Ostrowick, Pierre M. J. G.; Hanotier, Jacques D. V.; and Vaerman, Joseph M. E. Selective halogenation of paraffins. 3,935,289, Cl. 260-660.000.

Derbyshire, George C., to Jacobs Manufacturing Co., Ltd., The. Drill chuck and method of assembly. 3,934,891, Cl. 279-61.000.

Derner, William J., to FMC Corporation. Preloaded double row spherical roller bearing. 3,934,957, Cl. 308-207.00A.

Derolf, Mahlon Robert, to Philadelphia Quartz Company. Alumina dispersions. 3,935,023, Cl. 106-308.00B.

DeRose, Ralph A.: *See*—
Cielaszyk, Edward F.; DeRose, Ralph A.; and Kravcik, John W., 3,935,433.

Derrick, Milford R.: *See*—
Cleveland, Dixon; and Derrick, Milford R., 3,935,523.

Detroit Edison Company, The: *See*—
Barry, Robert E.; and Herter, Vincent J., 3,934,817.

Booker, Leonard, 3,934,522.

Detroit Gasket & Manufacturing Co.: *See—*
Doerfling, Ralph G.; and Motycka, Charles J., 3,935,353.

Deve, Vagn, to Combustion Engineering, Inc. Mixing apparatus. 3,934,859, Cl. 259-8.000.

Dexion-Comino International Limited: *See—*
Straffon, Alan E.; and King, James C., 3,935,559.

Dhein, Rolf: *See—*
Wingler, Frank; Pedain, Josef; Muller, Richard; Dhein, Rolf; and de Cleur, Eckhard, 3,935,138.

Diagnostic Research, Inc.: *See—*
Perry, Russell C.; and Porter, Roy W., 3,935,075.

Diamond, David. Gravity-actuated fluid displacement power generator. 3,934,964, Cl. 415-7.000.

Diamond Shamrock Corporation: *See—*
Beckers, Norman L.; and Rowe, Edward A., 3,935,287.
Faunce, John Porter, 3,935,004.
Kelly, James M.; and Papalos, John G., 3,934,975.
LaFortune, Robert G. J., 3,934,650.

Diblick, Alex V.: *See—*
Carlson, Elmer V.; Mostardo, August F., Jr.; and Diblick, Alex V., 3,935,398.

Dick, Clarence R.: *See—*
Phillips, Prella M.; Dick, Clarence R.; and Baggett, Joseph M., 3,935,269.

Dick, George Wilmer; and Hatfield, Walter Bryan, to Bell Telephone Laboratories, Incorporated. Single substrate plasma discharge cell. 3,935,494, Cl. 313-190.000.

Dick, Raymond S.; and Anenson, David H., to Hoerner Waldorf Corporation. Carton sealing. 3,934,791, Cl. 229-37.00R.

Dickensheets, William E.; and Pruchno, Albert A., to Ford Motor Company. Carburetor cold engine fuel enrichment system. 3,935,290, Cl. 261-39.00B.

Dickert, Joseph J., Jr., to Mobil Oil Corporation. Grease compositions. 3,935,122, Cl. 252-33.200.

Dictaphone Corporation: *See—*
Whitney, James C., 3,934,774.

Diehn, Philip H.; and Bergh, John C., to Wheelabrator-Frye, Inc. Portable upblast cleaning head. 3,934,372, Cl. 51-8.0SR.

Dietrich, Henri: *See—*
Dazzi, Joachim; Kirchmayr, Rudolf; and Dietrich, Henri, 3,935,251.

Digital Components Corporation: *See—*
Sterbal, Silvester, 3,935,501.

Diliberti, Joseph. Camping apparatus for van-type vehicle. 3,934,924, Cl. 296-23.00R.

Dirriwachter, John W.; and Kelly, Robert J., to Forney Engineering Company. Low fire light-off apparatus. 3,934,557, Cl. 122-448.00B.

Di Salvo, Salvatore; and Moriondo, Mario, to Fiat Societa per Azioni. Device for cleaning the headlight glass on motor vehicles. 3,934,301, Cl. 15-250.220.

Disque, Karl; Holzgen, Helmut; and Stauch, Philipp, to Erdol-Raffinerie Neustadt GmbH & Co.; and King-Wilkinson, Inc. Apparatus for separating low-density liquid from a relatively more dense liquid substantially immiscible therewith. 3,935,103, Cl. 210-97.000.

Disston, Inc.: *See—*
Jones, John E.; and Lineback, Lynn D., 3,934,340.

Ditzel, Heinz; and Ditzel, Werner. Mechanism for making roller-hub grooves. 3,934,378, Cl. 51-216.0ND.

Ditzel, Werner: *See—*
Ditzel, Heinz; and Ditzel, Werner, 3,934,378.

Doane, William M.: *See—*
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,935,099.

Dr. -Ing H.c.F. Porsche Aktiengesellschaft: *See—*
Kunz, Emil, 3,934,689.

Dodd, Joseph L., to Teledyne Industries, Inc. Integrated precombustion chamber for internal combustion engines. 3,934,560, Cl. 123-32.00B.

Doddridge, Ivan C.: *See—*
Reilly, Albert F.; Doddridge, Ivan C.; and Chen, Ming Chih, 3,935,329.

Doerfling, Ralph G.; and Motycka, Charles J., to Detroit Gasket & Manufacturing Co. Heat shrinkable decorative covering material for vehicle panels. 3,935,353, Cl. 428-99.000.

Doerig, Roland Karl. Procedure for conservation of living organs and apparatus for the execution of this procedure. 3,935,065, Cl. 195-1.700.

Doggett, Frederick F.; and Jenne, Leonard W., Jr., to General Electric Company. Electron gun assembly. 3,935,498, Cl. 313-417.000.

Dollhausen, Manfred; and Hohmann, Gerhard, to Bayer Aktiengesellschaft. Heat-sealing adhesives. 3,935,134, Cl. 260-3.500.

Dollhausen, Manfred; and Hohmann, Gerhard, to Bayer Aktiengesellschaft. Heat-sealing adhesives. 3,935,135, Cl. 260-3.500.

Dolphin International, Inc.: *See—*
Bokenkamp, Donald G., 3,934,647.

Dombrowski, Thaddeus: *See—*
Black, Dewie E.; Fabry, Donald F.; and Dombrowski, Thaddeus, 3,935,447.

Domtar Limited: *See—*
Elaschuk, George, 3,934,805.

Donaho, Ruel M., Jr., to Hughes Tool Company. Low-wear grease for journal bearings. 3,935,114, Cl. 252-18.000.

Donau-Pharmazie Gesellschaft m.b.H.: *See—*
Zellner, Hugo, deceased, 3,935,214.

Donnelly, Thomas L.; and Mullen, Edward J., to Xerox Corporation. Flash fusing apparatus. 3,935,424, Cl. 219-216.000.

Doolittle, James B.: *See—*
Terrell, Melvin L.; Lange, Paul F.; and Doolittle, James B., 3,934,816.

Dorfman, Michael B.; and Logan, Robert E., to Addressograph Multigraph Corporation. Magnetic impulse record element laminate and method of making same. 3,935,361, Cl. 428-189.000.

Doria, Gianfederico: *See—*
Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, 3,935,254.

Dorn, Harry M. Light guard. 3,935,560, Cl. 240-102.00B.

Douglas Leigh Research and Development Corporation: *See—*
Hagen, Frederic, 3,934,291.

Dow Chemical Company, The: *See—*
Ault, Eldon F.; and Solomon, Richard A., 3,934,981.
Burkholder, Nelson D.; Wisner, Ralph L.; and Taber, Dudley A., 3,935,363.
Harrisberger, William H., 3,934,455.
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Phillips, Prella M.; Dick, Clarence R.; and Baggett, Joseph M., 3,935,269.
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Dow Corning Limited: *See—*
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Dowell, Frederick Sidney: *See—*
Stimson, Ian Leonard; and Dowell, Frederick Sidney, 3,934,686.

Drabek, Jozef: *See—*
Beriger, Ernst; Boger, Manfred; Drabek, Jozef; and Kristiansen, Odd, 3,935,233.

Drag Specialties, Inc.: *See—*
Preisler, James Michael, 3,935,445.

Drageriwerk Aktiengesellschaft: *See—*
Zimmer, Hildebrand, 3,934,589.

Draney, Charles T.: *See—*
Lambly, Charles A. R.; and Draney, Charles T., 3,934,935.

Dresser Industries, Inc.: *See—*
Biffle, Morris S., 3,934,887.
Bishop, Burton DeWolfe, 3,934,680.

Driscoll, David M. Clamping device. 3,934,316, Cl. 24-243.0CC.

Droesch, Albert: *See—*
Schmid, Paul; and Droesch, Albert, 3,935,110.

Du-Co Ceramics Company: *See—*
Cooper, Leland L.; and Beer, Darl L., 3,935,376.

Du Bois, Donald W.; and Darlington, William B., to PPG Industries, Inc. Suppression of crevice corrosion in gasketed titanium crevices by the use of rubber compound gaskets substantially free of calcium. 3,935,350, Cl. 428-35.000.

Dubuque Awning & Tent Company: *See—*
Frommelt, Cyril P.; and Frommelt, Sylvan J., 3,934,380.

Duchesneau, Eugene Alfred, Jr.: *See—*
Nickerson, Richard Gorham; Bouchard, Robert Thomas; Hurtubise, Paul Joseph Charles; and Duchesneau, Eugene Alfred, Jr., 3,935,151.

Duck, Sherman W.: *See—*
Condon, John F.; Jeffers, Frederick J.; Duck, Sherman W.; and Bachand, Richard C., 3,935,578.

Duffy, James J.: *See—*
Golborn, Peter; and Duffy, James J., 3,935,162.

Dumas, Andre Pierre Fernand: *See—*
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Manoury, Philippe Michel Jacques; and Dumas, Andre Pierre Fernand, 3,935,229.

Duncan, Richard A.: *See—*
Brassette, Donald J.; and Duncan, Richard A., 3,934,391.

Dunckel, Thomas L., to United States of America, Energy Research and Development Administration. Emergency heat removal system for a nuclear reactor. 3,935,063, Cl. 176-38.000.

Dunkerley, Kenneth: *See—*
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, 3,934,972.

Dunlap, Danny L.; Huelsman, Charles E.; and Muhlenkamp, John H., to Stamco Division, The Monarch Machine Tool Company. Mandrel assembly. 3,934,836, Cl. 242-72.100.

Dunlop Limited: *See—*
Stimson, Ian Leonard; and Dowell, Frederick Sidney, 3,934,686.

Du Pont de Nemours, E. I., and Company: *See—*
Lee, Jerald Dana, 3,935,454.
Wyeth, Nathaniel Convers; and Arnoth, Frank William, 3,935,358.

Dutro, Lyle V. Device for issuing single units of flat flexible articles. 3,934,754, Cl. 221-213.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Schade, Gerhard, 3,935,165.

E. R. Squibb & Sons, Inc.: *See—*
Hauck, Frederic Peter; Cimarusti, Christopher M.; and Narayanan, Venkatachala Lakshmi, 3,935,267.
Hoehn, Hans, 3,935,222.
Wade, Peter C.; and Vogt, Berthold Richard, 3,935,227.
Yale, Harry L., 3,935,197.
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E-Systems, Inc.: *See—*
Holmes, Lloyd H., 3,934,941.
Pickles, Sidney, 3,935,576.

E. W. Bowman, Incorporated: *See—*
Bowman, Edward W., deceased; Bowman, Muriel B., executrix; and Bowman, Michael Edward, executor, 3,934,993.

Easter, Avard Joseph. Farm produce containers. 3,934,790, Cl. 229-23.00R.

Eastman Kodak Company: *See—*
Cawley, John Duval, 3,935,154.
Condon, John F.; Jeffers, Frederick J.; Duck, Sherman W.; and Bachand, Richard C., 3,935,578.
Gilman, Paul B., Jr., 3,935,010.
Lelental, Mark, 3,935,013.
Lestina, Gregory James; and Bush, Walter Monroe, 3,935,262.
Lestina, Gregory James; and Bush, Walter Monroe, 3,935,263.

Easton, Fred H.; and Helmer, N. Donald. Non-refillable multiple dosage syringe. 3,934,586, Cl. 128-235.000.

Easton, James Leland; and Filice, Gary William. Hockey stick. 3,934,875, Cl. 273-67.00A.

Eaton, Michael Anthony William: *See—*
Hutchinson, David Wesley; and Eaton, Michael Anthony William, 3,935,185.

Eberhard, Frank A. Radar mount and holding bracket. 3,934,771, Cl. 224-42.42A.

Eberle, William J., to General Battery Corporation. Acid filling apparatus for batteries or the like. 3,934,624, Cl. 141-100.000.

Eckersley, Dennis: *See—*
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, 3,934,972.

Eckert, Terry T.: *See—*
Hauser, Ambrose A.; Eckert, Terry T.; and McDonel, James D., 3,934,322.

Edge, Fred: *See—*
Muddiman, George Robert; and Edge, Fred, 3,934,602.

Edge, Michael D.: *See—*
Jones, Gordon H.; Moffatt, John G.; and Edge, Michael D., 3,935,184.

Edwards, Bryan William: *See—*
McCrainor, Peter Richard; and Edwards, Bryan William, 3,934,639.

Edwards, Bryant, to Illinois Tool Works Inc. Nestable article. 3,934,725, Cl. 206-519.000.

Edwards, John A.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,935,209.

Egorov, Jury Dmitrievich; Kavyarov, Ivan Savvateevich; Samatov, Jury Petrovich; Chasovodov, Nikolai Alexandrovich; and Chirikhin, Jury Ivanovich. Two-step final drive of a crawler tractor with running bogies. 3,934,665, Cl. 180-9.620.

Eguchi, Ronald G.; Mann, Michael M.; Lacina, William B.; and Crill, Kay C., to Northrop Corporation. Laser mode locking and coupling method and apparatus. 3,935,543, Cl. 331-94.50M.

Eian, Gilbert L., to Minnesota Mining and Manufacturing Company. Photosensitive sheet materials. 3,935,012, Cl. 96-48.00R.

Eibofner, Eugen, to Kaltenbach & Voigt. Dental handpiece or elbows for mounting dental treatment tools. 3,934,349, Cl. 32-27.000.

Eidinger, Adolf, to BBC Brown Boveri & Company Limited. Synchronized switch with parallel contact. 3,935,509, Cl. 317-11.00A.

Eigenmann, Ludwig. Anti-skid and wear-resisting road marking tape material. 3,935,365, Cl. 428-323.000.

Ekornes, Jostein, to J.E. Ekornes Fabrikker A/S. Adjustable chair. 3,934,932, Cl. 297-320.000.

Ekstrom, Bertil Ake: *See—*
Dahlen, Sven Erik; Ekstrom, Bertil Ake; Kovacs, Odon Kalman Jozsef; and Sjoberg, Berndt Olof Harald, 3,935,204.

Elaschuk, George, to Domtar Limited. Appliance base. 3,934,805, Cl. 248-346.000.

Electro Oxide Corporation: *See—*
Smith, Baynard R., 3,935,366.

Electroacustic GmbH: *See—*
Kuhn, Hans-Robert, 3,934,364.

Electronic Industries, Inc.: *See—*
West, Roger A., 3,935,397.

Electronic Machine Control (Sales) Limited: *See—*
Straffon, Alan E.; and King, James C., 3,935,559.

Elek, Zoltan; and Paulsen, George M. Energy dissipator ring. 3,934,614, Cl. 138-44.000.

Eli Lilly and Company: *See—*
Spurgeon, A. Dale, 3,935,450.

Ellies, Alan David: *See—*
Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan David, 3,934,934.

Ellin, Seymour, to Polaroid Corporation. Flash lamp signaling circuit employing logic signal activation. 3,935,514, Cl. 317-80.000.

Ellington, Robert W. Bike booster. 3,934,666, Cl. 180-11.000.

Elson, Donald Edwin; and Walter, Richard Thomas, to Black and Decker Manufacturing Company, The. Battery charging circuit with thermostat control. 3,935,525, Cl. 320-35.000.

Emhart Corporation: *See—*
Rowe, George E., deceased, 3,934,998.

Energy Development Associates: *See—*
Symons, Philip Charles, 3,935,024.

Energy Research Corporation: *See—*
Baker, Bernard; and Klein, Martin, 3,935,029.

Eng, Jeffrey D.; and Harke, Cyril J., to Hooker Chemicals & Plastics Corporation. Production of aqueous metal hydroxide solutions of low metal halide concentration. 3,935,096, Cl. 210-22.000.

Engelfried, Otto; Nieuweboer, Bob; Petzoldt, Karl; Kerb, Ulrich; and Lubke, Klaus, to Schering Aktiengesellschaft. Radioactively labeled steroid derivatives. 3,935,245, Cl. 260-397.100.

English Electric Company Limited, The: *See—*
Orszak, Peter, 3,934,814.

Enserch Corporation: *See—*
Goldsberry, Fred L., 3,934,424.

Eon Corporation, The: *See—*
Anton, Nicholas G., 3,935,456.

Epple, Richard R.: *See—*
Tiernan, Stanton W.; and Epple, Richard R., 3,934,625.

Epshtein, Alexandr Mikhailovich: *See—*
Petrusenko, Dmitry Pavlovich; Andreev, Lev Grigorievich; and Epshtein, Alexandr Mikhailovich, 3,935,090.

Erdol-Raffinerie Neustadt GmbH & Co.: *See—*
Disque, Karl; Holzgen, Helmut; and Stauch, Philipp, 3,935,103.

Escher Wyss GmbH: *See—*
Biornstad, Peter, 3,935,061.

Eschweiler, Helmut: *See—*
Proksch, Emil; and Eschweiler, Helmut, 3,935,364.

Esco, Inc.: *See—*
Stein, Clinton L.; and Holien, Dennis D., 3,934,365.

Esposito, Vincent J.: *See—*
Little, Steven M.; Gerber, Robert L.; Heller, Carl A.; and Esposito, Vincent J., 3,934,539.

Etat Francais: *See—*
Cadman, Martyn A.; Voinov, Michel; and Tannenberger, Helmut, 3,935,025.

Eternit-Werke Ludwig Hatschek & UCB,S.A.: *See—*
Proksch, Emil; and Eschweiler, Helmut, 3,935,364.

Ethyl Corporation: *See—*
Keblys, Kestutis A., 3,935,228.
Wiegand, Karl E., 3,935,216.

Evans, Anthony C., to Kelsey-Hayes Company. Combined service and parking brake with automatic adjustor. 3,934,684, Cl. 188-71.900.

Evans, Theodore A.: *See—*
Conger, Marvin T.; Evans, Theodore A.; and Villemain, Herbert F., 3,935,050.

Expert Industrial Controls Ltd.: *See—*
Marsden, John Thomas, 3,934,815.

Exxon Production Research Company: *See—*
Cooke, Claude E., Jr., 3,935,339.
Nierode, Dale E.; Kehn, Donald M.; and Kruk, Keith F., 3,934,651.

F. B. Electronics: *See—*
Bruner, William L., 3,935,561.

Fabrique Nationale Herstal S.A.: *See—*
Gabriels, Andre J., 3,934,513.

Fabry, Donald F.: *See—*
Black, Dewie E.; Fabry, Donald F.; and Dombrowski, Thaddeus, 3,935,447.

Fafco, Incorporated: *See—*
Ford, Freeman A.; Armstrong, Errol; and Rhodes, Richard O., 3,934,323.

Falbe, Jurgen: *See—*
Tummes, Hans; Falbe, Jurgen; and Cornils, Boy, 3,935,285.

Falk, Jean-Pierre; and Rohr, Andre, to Societe Anonyme des Ateliers de Secheron. Circuit for the compensation of current interference signals. 3,935,512, Cl. 317-27.00R.

Falk, Robert Allan: *See—*
Dear, Robert Ernest Arthur; and Falk, Robert Allan, 3,935,277.

Fanguy, Jude Thaddeus: *See—*
Curry, Willie A., 3,934,466.

Fanshawe, William Joseph; and Safir, Sidney Robert, to American Cyanamid Company. Cyclopropyl 1,2,4-oxadiazolyldiazines. 3,935,211, Cl. 260-250.00A.

Fanta, George F.: *See—*
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,935,099.

Farish, Owen: *See—*
Riemersma, Henry; and Farish, Owen, 3,935,547.

Farrell, Claude S., Jr.; Cone, Richard E., II; and Ellies, Alan David, to Buckeye International, Inc. Child car seating apparatus and method for assembling the same. 3,934,934, Cl. 297-384.000.

Farris, Vernie L., to Federal Sign and Signal Corporation. Door closure device. 3,934,306, Cl. 16-48.500.

Faunce, John Porter, to Diamond Shamrock Corporation. Addition of alloying constituents to aluminum. 3,935,004, Cl. 75-68.00R.

Faxen, Per Torsten: *See—*
Karlsson, Frans Harry; and Faxen, Per Torsten, 3,934,276.

Fearing, Donald David. Marking tag. 3,934,368, Cl. 40-301.000.

Federal Sign and Signal Corporation: *See—*
Farris, Vernie L., 3,934,306.

Fein, Marvin Michael; Colgate, Paul Alexander; and Kent, Ronald Allan, to Dart Industries Inc. Copper chromite catalyst and the process for producing it. 3,935,128, Cl. 252-467.000.

Feinleib, Julius: *See—*
Aldrich, Ralph E.; and Feinleib, Julius, 3,935,441.

Feinstein, Allen; and Fields, Ellis K., to Standard Oil Company. Vapor phase conversion of aromatic esters to aromatic aldehydes. 3,935,265, Cl. 260-599.000.

Fels, Emil, to Buss, A.G. Method of mounting pipe flanges in the wall of a pressure vessel. 3,934,787, Cl. 228-184.000.

Fels, Werner, to Rudolf Hell GmbH. Device for handling photographic film between a cassette and an exposure reproduction apparatus. 3,935,584, Cl. 354-214.000.

Feminella, Joseph V.; and Grindstaff, Donald A., to Stauffer Chemical Company. Process for improving whipping properties of aqueous protein solutions. 3,935,323, Cl. 426-564.000.

Ferguson, Ronald Worden: *See—*
Bagen, Herbert John; Ferguson, Ronald Worden; Korytkowski, Henry M.; and Mowry, William H., Jr., 3,934,501.

Fernholz, Hans: *See—*
Jacobsen, Gunter; Fernholz, Hans; and Freudenberger, Dieter, 3,935,274.

Ferraro, Frank A.: *See—*
Dawidowicz, Jan; and Ferraro, Frank A., 3,934,339.

Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, to Beecham Group Limited. Penicillins. 3,935,189, Cl. 260-239.100.

Ferres, Harry; Kemmence, Adrian Victor; and Best, Desmond John, to Beecham Group Limited. Penicillins. 3,935,192, Cl. 260-239.100.

Fetsch, Joseph T. System for locking doors of buses. 3,934,925, Cl. 296-28.00A.

Feuer, Henry; and Lawrence, John Pennington, to Purdue Research Laboratory. Antimicrobial dihalonitromethylisoxazoles. 3,935,219, Cl. 260-307.00H.

Fiat Societa per Azioni: *See—*
Di Salvo, Salvatore; and Moriondo, Mario, 3,934,301.
Fuso, Oscar, 3,934,430.
Palazzetti, Mario; and Grisotto, Franco, 3,934,337.

Fibreglass Limited: *See—*
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Fields, Ellis K.: *See—*
Feinstein, Allen; and Fields, Ellis K., 3,935,265.

Filice, Gary William: *See—*
Easton, James Leland; and Filice, Gary William, 3,934,875.

Fine, Maynard W. Auxiliary wheel for vehicles. 3,934,936, Cl. 301-38.00S.

Firtion, Victor Andrew: *See—*
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,934,949.

Fischer, Adolf, to BASF Aktiengesellschaft. Herbicidal mixture of a pyrozolium salt and benzothiadiozinone derivative. 3,935,000, Cl. 71-91.000.

Fischer, Adolf, to BASF Aktiengesellschaft. Herbicide mixtures of uracil, a carbamate and a pyridazone. 3,935,001, Cl. 71-92.000.

Fischer, Adolf; Hansen, Hanspeter; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Sulfites of aliphatic glycolic amides. 3,935,190, Cl. 260-239.00B.

Fischer, Adolf; Hamprecht, Gerhard; and Huber, Rolf, to BASF Aktiengesellschaft. N,N-disubstituted 2,1,3-benzothiadiazin-(4)-one-2,2-dioxide. 3,935,200, Cl. 260-243.00R.

Fischer, Dennis D., to United States of America, Interior. Process for eluting adsorbed gold and/or silver values from activated carbon. 3,935,006, Cl. 75-118.00R.

Fischer, Wolfgang: *See—*
Hutai, Hubert; and Fischer, Wolfgang, 3,934,913.

Fishwick, Brian Ribbons: *See—*
Baird, David Boyd; Baker, Ronald; Fishwick, Brian Ribbons; and McClelland, Robert David, 3,935,232.
Baron, Thomas Douglas; Fishwick, Brian Ribbons; Leng, John Lindley; and Yelland, Michael, 3,935,183.

Fitterer, Charles E.; and Cassler, Carl D., to Fitterer Engineering Associates, Inc. Method and apparatus for displaying active oxygen and sensor temperature. 3,935,079, Cl. 346-45.000.

Fitterer Engineering Associates, Inc.: *See—*
Fitterer, Charles E.; and Cassler, Carl D., 3,935,079.

Fitzhugh, Davis. Irrigation system water emitter. 3,934,824, Cl. 239-534.000.

Fives-Cail Babcock: *See—*
Chielens, Alain, 3,934,641.

Flaherty, William H., Jr.: *See—*
Ulatowski, Henry J.; and Flaherty, William H., Jr., 3,934,371.

Flax, Valere, to Metal Box Limited. Apparatus for making tubular containers. 3,934,780, Cl. 228-2.000.

Fleissner, Heinz, to Vepa AG. Apparatus for the continuous steaming of man-made fibers. 3,934,432, Cl. 68-5.00D.

Fletcher, John, to Lawrence Peska Associates, Inc., a part interest. Reinforcing elements for shoe soles and heels. 3,934,359, Cl. 36-73.000.

Flider, Frank S., to Justrite Manufacturing Company. Process for making a plastic walled device. 3,934,328, Cl. 29-453.000.

Flint, Edward F. Processing apparatus for clear air turbulence detection. 3,935,460, Cl. 250-349.000.

FMC Corporation: *See—*
Derner, William J., 3,934,957.

Foote, Seldon T., deceased: *See—*
Snyder, Alan Kent; Schmidt, Arthur D.; Foote, Seldon T., deceased; and Clipp, Robert R., executor, 3,934,702.

Ford, Anthony R., to Airpax Electronics Incorporated. Toggle switch. 3,935,411, Cl. 200-67.00G.

Ford, Freeman A.; Armstrong, Errol; and Rhodes, Richard O., to Fafco, Incorporated. Solar heat exchange panel and method of fabrication. 3,934,323, Cl. 29-157.30R.

Ford Motor Company: *See—*
Asik, Joseph R.; and Hanabusa, Mitsugu, 3,934,570.
Dickensheets, William E.; and Pruchno, Albert A., 3,935,290.

Fordath, Limited: *See—*
Parsonage, Raymond Arthur; and Higgs, Harold, 3,934,858.

Forgues, Louis V., to Parks-Cramer Company. Changeover valves with bypass and bent valving. 3,935,108, Cl. 210-340.000.

Forney Engineering Company: *See—*
Dirriwachter, John W.; and Kelly, Robert J., 3,934,557.

Forsgren, Lyle M., to Brunswick Corporation. Ground engaging drive track apparatus for snowmobiles and the like. 3,934,944, Cl. 305-38.000.

Forsythe, Theresa M.: *See—*
Reichenbacher, Paul H.; Forsythe, Theresa M.; Sparks, Allen K.; and Symon, Ted, 3,935,234.

Foseco International Limited: *See—*
McCrainor, Peter Richard; and Edwards, Bryan William, 3,934,639.
Potier, Pierre Roger, 3,934,637.

Foster, Alan Carl: *See—*
Clark, Jack Phillip; Smith, Thurman Dale; and Foster, Alan Carl, 3,934,457.

Foster, Donald A. Automatic friction drive transmission. 3,934,481, Cl. 74-190.500.

Foster, Edward T.: *See—*
Bruner, A. J.; Foster, Edward T.; and Kearns, Thomas N., 3,934,540.

Fox, George G. Bowling bag cart. 3,934,895, Cl. 280-47.260.

Fox, Richard W., Jr.; and Mullaly, Jerome R., to General Electric Company. Electronic switching circuit with zero voltage switching. 3,935,482, Cl. 307-252.00B.

Fox, Robert H.; Henning, Robert J.; and Psensky, Miroslav, to Quaker Oats Company, The. Slitted flexible mold. 3,934,809, Cl. 249-117.000.

Fox, Shirl S.: *See—*
Lash, Harvey; Kibrick, Morris; and Fox, Shirl S., 3,934,347.

Frain, John P.; Harman, John N., III; and Neti, Radhakrishna M., to Beckman Instruments, Inc. Nitric oxide analysis and scrubber therefor. 3,934,991, Cl. 55-316.000.

Frank, Robert G., to PPG Industries, Inc. Conveyor rolls on conveyor roll systems for roll forming apparatus. 3,934,996, Cl. 65-106.000.

Franson, Claude: *See—*
Fulconis, Pierre; and Franson, Claude, 3,935,242.

Franz, Helmut, to PPG Industries, Inc. Multiple glazed windows including selective reflecting metal/metal oxide coatings. 3,935,351, Cl. 428-34.000.

Fred Whitaker Company: *See—*
Westmoreland, Robert W., Sr., 3,934,431.

Frederick's of Hollywood: *See—*
Mellinger, Frederick N., 3,934,593.

Fredrickson, Larry E.; and Coates, Thomas L. Pile splicing apparatus and method. 3,934,422, Cl. 61-53.000.

Freeburg, Dale O.: *See—*
Johnson, Clifford E.; Freeburg, Dale O.; and Hyler, John H., 3,934,361.

Freeman, Brady L.: *See—*
Marlow, Darrell W.; and Freeman, Brady L., 3,934,984.

Freeman, James M., Jr.; Gans, Bruce E.; Lambiris, Sotiris; and Woodmansee, Donald E., to General Electric Company. Combined wall burner and flameholder for HRSG. 3,934,553, Cl. 122-7.00B.

Freiter, Gerhard, to U.S. Philips Corporation. Bearing of a pick-up arm for a record player. 3,934,885, Cl. 274-23.00R.

French, Walter K., to Seagrave Corporation, The. Method of cutting hot glass band. 3,934,995, Cl. 65-97.000.

Freudenberger, Dieter: *See—*
Jacobsen, Gunter; Fernholz, Hans; and Freudenberger, Dieter, 3,935,274.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Naphthyl acetaldehyde derivatives. 3,935,273, Cl. 260-600.00R.

Fried, John H.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,935,209.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Leisterer, Reinhard; Mahlstedt, Walter; and Rubel, Manfred, 3,935,575.
Susse, Wilhelm; and Alter, Heinz, 3,935,095.

Fried. Krupp Huttenwerke AG: *See—*
Nelken, Ewald, 3,934,921.

Friedrich Uhde GmbH: *See—*
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Fritz Buser AG., Maschinenfabrik: *See—*
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Fritz, Heinz Peter; and Missol, Detlef, to Rheinisch-Westfalisches Elektrizitatswerk AG. Process for making lead electrode. 3,935,082, Cl. 204-32.00R.

Fritz, Jack J.: *See—*
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Frommelt, Cyril P.; and Frommelt, Sylvan J., to Dubuque Awning & Tent Company. Loading dock shelters. 3,934,380, Cl. 52-173.0DS.

Frommelt, Sylvan J.: *See—*
Frommelt, Cyril P.; and Frommelt, Sylvan J., 3,934,380.

Fromnick, Stephen M.: *See—*
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Fronk, Stanislav Vladislavovich: *See—*
Korovin, Stanislav Konstantinovich; Kruglov, Igor Ivanovich; Preobrazhentsev, Konstantin Andreevich; Sidorov, Jury Ivanovich; and Fronk, Stanislav Vladislavovich, 3,935,585.

Frotschner, Eberhard: *See—*
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Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, 3,935,015.

Nishimura, Tokio; Yamada, Minoru; Amano, Hiroyuki; and Oishi, Yasushi, 3,935,016.
Ohta, Takahiro, 3,935,589.
Suzuki, Gyoji; and Tomotsu, Takeshi, 3,935,117.
Fujieda, Mamoru; Yamauchi, Teruo; and Momono, Masakichi, to Hitachi, Ltd. Fuel evaporating device. 3,934,567, Cl. 123-122.00H.
Fujii, Tadashiro: *See—*
Abe, Jinnosuke; Watanabe, Tetsuo; Take, Teruo; Fujimoto, Kentaro; Fujii, Tadashiro; and Nishiie, Kazuyoshi, 3,935,193.
Fujimori, Yoshiaki. Structure of bezel portion of water-tight timepiece. 3,934,402, Cl. 58-90.00R.
Fujimoto, Kentaro: *See—*
Abe, Jinnosuke; Watanabe, Tetsuo; Take, Teruo; Fujimoto, Kentaro; Fujii, Tadashiro; and Nishiie, Kazuyoshi, 3,935,193.
Fujiwara, Shinichi: *See—*
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Fukada, Kazuo: *See—*
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Fukatsu, Hiroshi: *See—*
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Fukuzawa, Hideo, to Rank Xerox Ltd. Apparatus for fixing with solvent vapors. 3,934,546, Cl. 118-48.000.
Fulconis, Pierre; and Franson, Claude, to Procida. Process for the preparation of colored maneb. 3,935,242, Cl. 260-429.00K.
Fuller, Gene E.: *See—*
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Fullerton, Gary D.: *See—*
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Fulton, Sheldon S.: *See—*
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G. D. Searle & Co.: *See—*
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G. M. Brooks Industries, Inc.: *See—*
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Gablin, Kenneth A., to Nuclear Engineering Co., Inc. Repository for fissile materials. 3,935,467, Cl. 250-507.000.
Gabriels, Andre J., to Fabrique Nationale Herstal S.A. Grenade-firing device. 3,934,513, Cl. 102-65.200.
Gabrielson, Dan A.: *See—*
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Gachot, Jean; and Lekarski, Simeon. Comparator for coded signals represented by a pressure of fluid. 3,934,611, Cl. 137-608.000.
Gaffard, Jean-Paul: *See—*
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Gage, Rodney E. Endless track adapted for use with track laying vehicles. 3,934,943, Cl. 305-35.0EB.
Gaio, Pietro: *See—*
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Galamore, Frazer W.; and Fulton, Sheldon S. Extendable anchor line guide and support with automatic release. 3,934,536, Cl. 114-210.000.
Gallagher, John Patrick, to Canadian Marine Drilling Ltd. Icebreaking vessels. 3,934,529, Cl. 114-40.000.
Galperin, Alexandr Lvovich: *See—*
Loschilin, Evgeny Dmitrievich; Galperin, Alexandr Lvovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and Sakharov, Boris Alexandrovich, 3,934,619.
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Gamble, James R., to Westinghouse Electric Corporation. Electrical bushing comprising a resin body and a ceramic outer shell. 3,935,377, Cl. 174-153.00R.
Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, to Carlo Erba S.p.A. 5c-prosten-13-ynoic acids. 3,935,254, Cl. 260-514.00D.
Gannaway, Edwin L., to Sundstrand Corporation. Refrigeration compressor and system. 3,934,967, Cl. 417-271.000.
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Garcia, Francisco Marlasca. Synchronizing apparatus for the drawing roller and the warp beam in a loom. 3,934,620, Cl. 139-99.000.
Gardner, Richard A., to International Business Machines Corporation. High-alumina content compositions containing BaO-MgO-SiO_2 glass and sintered ceramic articles made therefrom. 3,935,017, Cl. 106-46.000.
Gardner, Willis W., to Waukesha Bearings Corporation. Leakproof seal for bearings. 3,934,952, Cl. 308-36.100.
Garment Finishing Equipment Corporation: *See—*
Bailey, Stanley M., 3,934,766.
Garrison, Harold Keith, to Hesston Corporation. Continuous feeding for stack forming loaders. 3,934,394, Cl. 56-344.000.
Gartung, Clifford W. Modular sound-absorbing screens. 3,934,382, Cl. 52-144.000.
Gasparino, Vincent J.: *See—*
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Sherwin, Leo H.; and Gilmore, Robert S., 3,934,460.
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General Mills, Inc.: *See—*
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General Motors Corporation: *See—*
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General Steel Industries, Inc.: *See—*
Reed, Winthrop B., 3,934,450.
Gentreau, Guy Rene, to Les Parfums de Dana, Inc. Outer container assembly for housing an aerosol. 3,934,761, Cl. 222-183.000.
George, Emanuel John; Salter, Joseph Lane; Sauer, Earl Salvator; and Tidd, Charles Edward, Jr., to Western Electric Company, Inc. Methods of manufacturing an insulated conductor and product produced thereby. 3,935,369, Cl. 428-379.000.
Georgetti, Richard A.: *See—*
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Ballass, John T.; and Georgetti, Richard A., 3,935,421.
Georgia-Pacific Corporation: *See—*
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Gerber, Robert L.: *See—*
Little, Steven M.; Gerber, Robert L.; Heller, Carl A.; and Esposito, Vincent J., 3,934,539.
Geri, Don W., to Primark Corporation. Merchandise label marking gun. 3,934,507, Cl. 101-291.000.
Gerin, Jacques Jean-Marie Jules. Lightweight high performance, high security vehicle. 3,934,668, Cl. 180-21.000.
Gerkin, Richard M.; Roberts, Rene; and Hodges, Joy C., to Union Carbide Corporation. Thermoplastic urethane polymer filled with cross-linked urethane polymer. 3,935,132, Cl. 260-2.5BE.
Gersten, Martin, to Ohm Acoustics Corporation. Loudspeaker voice coil arrangement. 3,935,402, Cl. 179-115.5VC.
Getz, Paul C.: *See—*
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GHH Basel AG: *See—*
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Giannella, Frank; and Pellicciari, Enzo. Multiple dispensing head for milk shake machines. 3,934,759, Cl. 222-129.100.
Gick, James Edward; and Gick, James Walker. Quiller. 3,934,834, Cl. 242-67.10R.
Gick, James Walker: *See—*
Gick, James Edward; and Gick, James Walker, 3,934,834.

Gijrath, Johannes Henricus Nicolaas, to U.S. Philips Corporation. Structure for attaching conical shield to shadow mask. 3,935,496, Cl. 313-402.000.

Gilissen, Hermanus Petrus Johannes, to AMP Incorporated. Electrical connector. 3,934,959, Cl. 339-17.00M.

Gilman, Paul B., Jr., to Eastman Kodak Company. Element and process for selectively forming positive or negative photographic images. 3,935,010, Cl. 96-27.00E.

Gilmore, Cecilia; and Miller, Donald E., to SCM Corporation. Freeze-thaw stable liquid coffee whitener. 3,935,325, Cl. 426-613.000.

Gilmore, Robert S.: *See—*
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Ginn, Le Roy; Ginn, Le Royce; and Travaglio, Dalny, to Universal Pneumatic Controls, Inc. Dual duct variable volume air conditioning system. 3,934,795, Cl. 236-13.000.

Ginn, Le Royce: *See—*
Ginn, Le Roy; Ginn, Le Royce; and Travaglio, Dalny, 3,934,795.

Gittos, Maurice W.; and Amey, David Anthony, to Aspro-Nicholas Limited. Conjugate addition. 3,935,207, Cl. 260-247.50R.

Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Manoury, Philippe Michel Jacques; and Dumas, Andre Pierre Fernand, to Synthelabo. Esters of 2-[(4-quinolyl)amino]-benzoic acids. 3,935,229, Cl. 260-268.0BQ.

Givaudan Corporation: *See—*
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Glass Tubes and Components Limited: *See—*
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Glasser, Albert D.: *See—*
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Glasson, Jerry Marshall; and Kabb, Harold Louis, to Teletype Corporation. Apparatus for synthesizing phase-modulated carrier wave. 3,935,386, Cl. 178-67.000.

Glaverbel-Mecaniver S.A.: *See—*
Lambert, Emmanuel; Lambert, Jean-Louis; and De Longueville, Bernard, 3,935,419.

Gleason, Robert W. Dermatome. 3,934,591, Cl. 128-305.500.

Gloge, Detlef Christoph: *See—*
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Go, Tadahiro; Suzuki, Takashi; and Inoue, Masaaki, to Nippon Zeon Co. Ltd. Novel aqueous coating compositions. 3,935,140, Cl. 260-19.0UA.

Godard, Bruno; Lacour, Bernard; and Gaffard, Jean-Paul, to Compagnie Generale d'Electricite. Gas laser structure for eliminating parasitic arcing. 3,935,544, Cl. 331-94.5PE.

Godshalk, Henry W.; and Sharma, Mohinder Paul, to Godshalk, Henry W. Aqueous pattern paint from carboxylic resin, N-aldehyde resin, polysiloxane resin and fluorocarbon surfactant. 3,935,147, Cl. 260-29.40R.

Goffredo, Daniel L.; and Shakely, Conrad Dale, to Chemcut Corporation. Method for treatment fluid application and removal. 3,935,041, Cl. 156-18.000.

Golborn, Peter; and Duffy, James J., to Hooker Chemicals & Plastics Corporation. Dialkyl aromatic amidomethyl phosphonate flame retardants. 3,935,162, Cl. 260-45.9NC.

Goldberg, Allan M., to American Hospital Supply Corporation. Sterile needle package. 3,934,722, Cl. 206-365.000.

Goldberg, Martin: *See—*
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Goldfarb, Adolph E.; and Benkoe, Erwin. Manipulative skill game apparatus having tiltable platforms and automatic feeder mechanism. 3,934,881, Cl. 273-110.000.

Goldkuhle, Werner P.; Arnold, Richard E.; and Johnson, Malcolm Ray, to LeBus International, Inc. Central hydraulic system for marine deck equipment. 3,934,416, Cl. 60-484.000.

Goldsberry, Fred L., to Enserch Corporation. Refrigerant expander compressor. 3,934,424, Cl. 62-87.000.

Goldsmith, Morris, to Partnership of Goldsmith, Josephson & Gulko. Heat saving apparatus. 3,934,798, Cl. 237-55.000.

Goldstein, Mihai. Device for mass production garment steaming. 3,934,765, Cl. 223-70.000.

Goodbrake, Chris J.: *See—*
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Goode, Robert W., to Hydra Dyne Corporation. Apparatus for winding pilot lines. 3,934,854, Cl. 254-134.30R.

Goodyear Tire & Rubber Company, The: *See—*
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Calderon, Nissim, 3,935,270.
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Wolfe, Merritt W., 3,935,045.

Gordon, Roy Gerald. Disposable articles having a water-permeable and water-repellent surface. 3,934,587, Cl. 128-284.000.

Gorrie, Thomas M., to Johnson & Johnson. Surgical wrap. 3,934,582, Cl. 128-157.000.

Gossard, Thomas F.: *See—*
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Grachev, Leonid Pavlovich: *See—*
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Graf, Felix: *See—*
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Grapes, Eugene F.: *See—*
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Grau, Gerhard, to Zinser Textilmaschinen GmbH. Spooling mechanism. 3,934,830, Cl. 242-18.0DD.

Graveman, Donald F., to American Pulverizer Company. Coal crusher. 3,934,826, Cl. 241-81.000.

Gray, Percy J.: *See—*
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Gray, Robert D., to Scott Paper Company. Apparatus for securing the free end of a roll of fibrous web material. 3,935,057, Cl. 156-578.000.

Greco, Nicholas P., to Koppers Company, Inc. Production of hydroquinone. 3,935,283, Cl. 260-621.00M.

Green, Edward H.; and Green, Edward H., Jr. Safety overcap for dispensing containers. 3,934,751, Cl. 220-306.000.

Green, Edward H., Jr.: *See—*
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Green, Geoffrey William: *See—*
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Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, to Imperial Chemical Industries Limited. Dyeing process. 3,934,972, Cl. 8-39.000.

Greenleaf, Joseph A. Slalom ski device. 3,934,893, Cl. 280-11.35K.

Greenwood Mills: *See—*
Holschlag, Jerry B., deceased; and Wilcox, Lyle, 3,935,436.

Greenwood, Robert C., to Pan-Nova, Inc. Gasoline dispenser. 3,935,435, Cl. 235-151.340.

Gresham, William F., to VSI Corporation. Door lockset and strike. 3,934,435, Cl. 70-150.000.

Greutert, Albert, to Interelectric AG. Reusable coffee filter. 3,935,112, Cl. 210-456.000.

Greve, Dale R.; and O'Neill, Eugene D., to Georgia-Pacific Corporation. Water-resistant gypsum products. 3,935,021, Cl. 106-111.000.

Grey, Donald M.; and Butler, Lee D., to Sperry Rand Corporation. Bale wagon. 3,934,734, Cl. 214-6.00B.

Grey Lab. Establishment, The: *See—*
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Griffin, Billy J. Baseball batting aid. 3,934,873, Cl. 273-26.00E.

Griffo, Joseph B. Fluid flow meter with counter rotating turbine impellers. 3,934,473, Cl. 73-231.00R.

Grindstaff, Donald A.: *See—*
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Grisotto, Franco: *See—*
Palazzetti, Mario; and Grisotto, Franco, 3,934,337.

Groelz, Jay C.; and Heinzman, John W., to Heinzman Engineering, Inc. Anti-run ahead system for traveling hose pull sprinklers. 3,934,819, Cl. 239-189.000.

Groppenbacher, Gregor; Rieckmann, Peter; and Rothe, Werner, to Boehringer Mannheim G.m.b.H. Process for coating tablets with aqueous resin dispersions. 3,935,326, Cl. 427-3.000.

Grotnes Machine Works, Inc.: *See—*
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Grove Valve and Regulator Company: *See—*
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Grudkowski, Thomas W.: *See—*
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Grupe, Ulrich, to Vereinigte Flugtechnische Werke-Fokker GmbH. Decimal adder. 3,935,438, Cl. 235-174.000.

Gruppo Lepetit, S.p.A.: *See—*
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GTE Laboratories Incorporated: *See—*
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Guerke, Guenter: *See—*
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Guillaneux, Pierre; Patou, Claude; and Tonon, Gianfranco, to Commissariat a l'Energie Atomique. Method and apparatus for injection of a plasma. 3,935,504, Cl. 315-111.700.

Gulf Oil Canada Ltd.: *See—*
Cymbalisty, Lubomyr M. O., 3,935,076.

Gumbinner, Robert; and Shimazu, Ken-ichi, to Polychrome Corporation. Method of producing an aluminum base sheet for a printing plate. 3,935,080, Cl. 204-28.000.

Gusdorf & Sons, Inc.: *See—*
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Gusdorf, Walter, to Gusdorf & Sons, Inc. Caster socket. 3,934,305, Cl. 16-43.000.

Gusev, Boris Pavlovich: *See—*
Malyshev, Leonid Mikhailovich; Indrupsky, Lev Iosifovich; Gusev, Boris Pavlovich; and Pisman, Yakov Borisovich, 3,934,568.

Guth, Lauren W., to General Electric Company. Dishwasher rack. 3,934,728, Cl. 211-128.000.

Guyton, Glen B. Check valve. 3,934,608, Cl. 137-527.800.

Guzman, Angel: *See—*
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H. H. Robertson Company: *See—*
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Habegger, Willy: *See—*
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Haber, Stephen K. Erratic movement tethered ball. 3,934,878, Cl. 273-95.00A.

Haddad, Daniel G., to Blodgett, Norman S. Game racket. 3,934,876, Cl. 273-73.00C.

Haenni & Cie Aktiengesellschaft: *See—*
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Hafner, Otto P. Method of interlocking overlapping sheet material. 3,934,327, Cl. 29-432.000.

Hagen, Frederic, to Douglas Leigh Research and Development Corporation. Water sports wheel. 3,934,291, Cl. 9-310.00G.

Hagen, Hans-Gunter: *See—*
Muller, Otto; Rottger, Hans; Kastl, Hans; and Hagen, Hans-Gunter, 3,934,731.

Hagenweiler, Kurt; and Scholz, Kurt, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Contact adhesives. 3,935,144, Cl. 260-24.000.

Haggerty, William H.; and Bolen, Gerhard N., to Owens-Corning Fiberglas Corporation. Sizing composition and glass fibers treated therewith. 3,935,344, Cl. 428-378.000.

Haggqvist, Ulw Lars Anders, to Vadstena Pumpar AB. Control unit for central heating systems. 3,934,609, Cl. 137-565.000.

Haines, David C. Surveying instrument. 3,934,353, Cl. 33-262.000.

Hall, Charles B., to Outboard Marine Corporation. Vibration isolating mount for an outboard motor. 3,934,537, Cl. 115-17.000.

Hall, John L. Anti-drip injection nozzle for plastic molding. 3,934,626, Cl. 141-117.000.

Haller, Roland, to Harsco Corporation. Power cylinder construction. 3,934,423, Cl. 92-52.000.

Halliburton Company: *See—*
Kampfer, John G., 3,935,556.

Halliday, Anthony James: *See—*
Taylor, John Thurston; Halliday, Anthony James; Angel, Jonathan George Cordy; and Blakemore, Bernard, 3,934,962.

Hamilton, Charles Howard; Koeller, Fred B.; Raymond, Roger S.; and Goldberg, Martin, to Rockwell International Corporation. Controlled environment superplastic forming of metals. 3,934,441, Cl. 72-60.000.

Hamilton, Willard C.: *See—*
Jelfo, Raymond L.; Strella, Stephen; and Hamilton, Willard C., 3,934,547.

Hamilton, William H.; and Coski, William D., to Ingersoll-Rand Company. Drill rod stabilization means. 3,934,945, Cl. 308-4.00A.

Hammerly, Robert C. Quick release mud flap hanger assembly for trucks and trailers. 3,934,901, Cl. 280-154.50R.

Hamprecht, Gerhard: *See—*
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Mangold, Dietrich; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 3,935,201.

Hanabusa, Mitsugu: *See—*
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Hand, Lowal L. Racked pipe reamer. 3,934,448, Cl. 72-380.000.

Hanna, Daniel C. Wheel cleaners. 3,934,296, Cl. 15-53.00B.

Hanna, Daniel C. Overhead car washes. 3,934,297, Cl. 15-53.0AB.

Hannah, Phillip L., to California Fruit Concentrates, Inc. Apparatus for cooking fruit and the like products. 3,934,497, Cl. 99-476.000.

Hanni, Stephen L., to Texas Instruments Incorporated. Method of fabricating metal printed wiring boards. 3,934,334, Cl. 29-625.000.

Hanotier, Jacques D. V.: *See—*
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Hansen, Hanspeter: *See—*
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Hansen, Laurence H., to Andrew Corporation. Flared microwave horn with dielectric lens. 3,935,577, Cl. 343-781.000.

Hanson, James M., to General Electric Company. Photoflash lamp array having electrically connected reflector. 3,935,442, Cl. 240-1.300.

Hanson, John Arvid, to United States Gypsum Company. Post-tensioning load cell. 3,934,465, Cl. 73-143.000.

Harada, Shuzi: *See—*
Kimura, Takeji; Oyama, Tomio; Yamada, Haruyasu; Harada, Shuzi; Yoshino, Hirokazu; and Tsuboka, Eiichi, 3,935,536.

Hardy, Francis R. F.; and King, Ian Robert, to Laporte Industries Limited. Lactones. 3,935,235, Cl. 260-343.600.

Hardy, John C.: *See—*
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Harke, Cyril J.: *See—*
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Harleman, Donald R. F.: *See—*
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Harman, John N., III: *See—*
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Harper, Robert J., Jr.: *See—*
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Harris Corporation: *See—*
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Harris, John Edward: *See—*
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Harrisberger, William H., to Dow Chemical Company, The. Apparatus for testing a sand sample. 3,934,455, Cl. 73-38.000.

Harrison, Ian T.: *See—*
Fried, John H.; and Harrison, Ian T., 3,935,273.

Harsco Corporation: *See—*
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Hart, Gary A.; and Wilson, Melvin G., to International Business Machines Corporation. D.C. coupled impedance reducing circuit. 3,935,540, Cl. 330-10.000.

Hart, Robert L. Starter enabling-disabling ignition safety seat belt for moving vehicles. 3,934,671, Cl. 180-82.00C.

Hartley, John H., Jr. Deflatable mammary augmentation prosthesis. 3,934,274, Cl. 3-36.000.

Haseda, Katsumi: *See—*
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Hasegawa, Shiro: *See—*
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Hasenauer, Dieter: *See—*
Strasser, Karl; and Hasenauer, Dieter, 3,935,028.

Hashimoto, Sadao; Sakakibara, Ryuji; Kurashige, Yasushi; Takikawa, Katsuo; Osame, Yoko; Minami, Hiroshi; and Suzue, Takashi, to Taiho Pharmaceutical Company, Limited. N-substituted guanidino acid derivatives. 3,935,266, Cl. 260-561.00A.

Hashimoto, Shigeru: *See—*
Aimoto, Kenji; Hashimoto, Shigeru; and Yoneda, Toyoaki, 3,935,307.

Hashizume, Hiroshi: *See—*
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Hashizume, Yoshio: *See—*
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Hata, Yoshitaka: *See—*
Togawa, Kinmochi; Matoba, Kazuo; Takao, Hiroshi; and Hata, Yoshitaka, 3,935,089.

Hatfield, Walter Bryan: *See—*
Dick, George Wilmer; and Hatfield, Walter Bryan, 3,935,494.

Hauck, Frederic Peter; Cimarusti, Christopher M.; and Narayanan, Venkatachala Lakshmi, to E. R. Squibb & Sons, Inc. Tetrahydronaphthyloxy-aminopropanols and salts thereof. 3,935,267, Cl. 260-570.700.

Haugen, Ronald L., to Ingersoll-Rand Company. Gas drying apparatus. 3,934,989, Cl. 55-163.000.

Hauser, Ambrose A.; Eckert, Terry T.; and McDonel, James D., to General Electric Company. Method for forming cooling slot in airfoil blades. 3,934,322, Cl. 29-156.80H.

Hauser, Raimund: *See—*
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Hawker Siddeley Dynamics Limited: *See—*
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Hawkins, John Richard; and Locke, John Michael, to International Synthetic Rubber Co., Ltd., The. Thermosplastic elastomeric materials. 3,935,176, Cl. 260-83.700.

Hayashi, Yoshikatsu: *See—*
Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Hayashi, Yoshikatsu, 3,935,084.

Haydock, James Livesey, to Acres Consulting Services Limited. Power generating plant. 3,935,469, Cl. 290-52.000.

Hayes, John C., to Universal Oil Products Company. High pressure regeneration of a coke-deactivated catalyst containing platinum, rhenium, halogen & sulfur. 3,935,244, Cl. 252-415.000.

Hayes, Thomas H.; and Ostrowsky, Efrem, to VCA Corporation. Cosmetic holder and applicator. 3,934,598, Cl. 132-88.700.

Hayes, William J., to Howmet Corporation. Boron diffusion coating process. 3,935,034, Cl. 148-6.000.

Hays, Wilford R. Valve cover having oil can opener. 3,934,623, Cl. 141-98.000.

Hearn, Daniel P., to Atlantic Richfield Company. Method and apparatus for sensing when a seismic gas exploder is in contact with the earth. 3,934,672, Cl. 181-117.000.

Heckel, Rene, to Maschinenfabrik Schweiter AG. Orientation alignment of apparatus for yarn cops being supplied to textile machines. 3,934,716, Cl. 198-252.000.

Heckmanns, Heinz: *See—*
Kress, Heinz; and Heckmanns, Heinz, 3,934,918.

Hedin, Sven Arvid, to ITT Industries, Inc. Flexible coupling. 3,934,428, Cl. 64-15.00C.

Hedstrom, Ture E. Safety device for lifts, hoists and like apparatus. 3,934,682, Cl. 187-78.000.

Heflinger, Lee O.; Wuerker, Ralph F.; and Brooks, Robert E., to TRW Inc. Multiple exposure holographic interferometer method. 3,934,461, Cl. 73-71.300.

Hege Advanced Systems Corporation: *See—*
Hege, Douglas W., 3,934,857.

Hege, Douglas W., to Hege Advanced Systems Corporation. Mixing and heat transfer apparatus. 3,934,857, Cl. 259-8.000.

Hehr International Inc.: *See—*
Kwan, Gerald A.; Penkov, Walter V.; and Roe, Norman E., 3,934,370.
Heimlicher, Paul, to Maschinenfabrik Wifag. Method and apparatus for adjusting rollers in a printing press. 3,934,508, Cl. 101-349.000.
Heine, Helmut A., to Propper Manufacturing Co., Inc.; and Optotechnik Heine KG, part interest to each. Direct illumination otoscope. 3,934,578, Cl. 128-9.000.
Heinzman Engineering, Inc.: *See—*
Groelz, Jay C.; and Heinzman, John W., 3,934,819.
Heinzman, John W.: *See—*
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Heise, Rainer: *See—*
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Heller, Carl A.: *See—*
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Helmer, N. Donald: *See—*
Easton, Fred H.; and Helmer, N. Donald, 3,934,586.
Hempel, Jan; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for making N-arylurea compounds and herbicidal compositions containing same. 3,935,258, Cl. 260-553.00A.
Henderson, Frank D. Golf putting aid. 3,934,874, Cl. 273-35.00A.
Henderson, James R., to Controls Southeast, Inc. Corrugated jacketed pipe assembly having vented enclosures for connecting welds. 3,934,617, Cl. 138-114.000.
Henderson, James R., to Controls Southeast, Inc. Jacketed pipe assembly formed of corrugated metal tubes. 3,934,618, Cl. 138-114.000.
Hendlin, David; Mata, Justo Martinez; Del Val, Sagrario Mochales; and Stapley, Edward O., to Merck & Co., Inc. Synergistic combinations of phosphonomycin and bacteriostatic agents. 3,935,309, Cl. 424-114.000.
Henniger, Wolfgang; Povh, Dusan; and Schraudolph, Manfred, to Siemens Aktiengesellschaft. Filter arrangement for a converter circuit. 3,935,551, Cl. 333-76.000.
Henning, Robert J., to Quaker Oats Company, The. Flexible mold. 3,934,810, Cl. 249-117.000.
Henning, Robert J.: *See—*
Fox, Robert H.; Henning, Robert J.; and Psensky, Miroslav, 3,934,809.
Henry, Joseph F.: *See—*
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Henry L. Hanson Co., Inc.: *See—*
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Henry Manufacturing Co., Inc.: *See—*
McEwen, Stephen N., 3,935,105.
Henry Pratt Company: *See—*
Kurkjian, Gregory A., Jr., 3,934,850.
Herbst, Edward J., to Continental Can Company, Inc. Non-detachable end unit. 3,934,750, Cl. 220-277.000.
Herrell, Robert C., to Baker-Roos. Overhead service unit. 3,934,681, Cl. 187-17.000.
Herter, Vincent J.: *See—*
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Herveling, Wilhelm: *See—*
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Herzog, Rollie R., to Construction Materials Division General Electric Company. Ballast circuit for eliminating flicker in gaseous discharge lamps. 3,935,502, Cl. 315-94.000.
Hess, Hans-Jurgen E., to Pfizer Inc. Process for hypotensive 4-amino-2-(piperazin-1-yl) quinazoline derivatives. 3,935,213, Cl. 260-256.40Q.
Hess, Johann T.; Debrunner, Kurt; and Tan, Aujit, to Grotnes Machine Works, Inc. Method and apparatus for forming automotive wheel rim blanks. 3,934,324, Cl. 29-159.100.
Hessen, Petter, to Allmanna Svenska Elektriska Aktiebolaget. Conservator system. 3,934,453, Cl. 73-19.000.
Hesston Corporation: *See—*
Garrison, Harold Keith, 3,934,394.
Hewlett-Packard Company: *See—*
Kovalick, Albert W., 3,934,695.
Heyden, Herbert Frank, to Union Plastics Corporation. Stand-off insulators. 3,935,378, Cl. 174-158.00R.
Hida, Takashi, to Aisin Seiki Kabushiki Kaisha. Braking pressure regulating device for a vehicle braking system. 3,934,939, Cl. 303-21.00A.
Higgs, Harold: *See—*
Parsonage, Raymond Arthur; and Higgs, Harold, 3,934,858.
High, Robert Edward; and Samways, Albert John, to Pennwalt Corporation. Centrifuge apparatus. 3,934,792, Cl. 233-7.000.
Higuchi, Takeru; Bodor, Nicolae S.; and Kuo, Yu-Neng, to Interx Research Corporation. Useful pro-drug forms of theophylline. 3,935,196, Cl. 260-240.00J.
Hillyer, Anthony William, to Raleigh Industries Limited. Epicyclic change speed gears. 3,934,493, Cl. 74-750.00B.
Himics, Richard Joseph: *See—*
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Hirano, Satoshi; Tsumura, Jusha; Imaseki, Izumi; and Kawasaki, Yoshimi, to Kabushiki Kaisha Tsumura Juntendo. Detergent composition for cleaning bathtubs. 3,935,130, Cl. 252-542.000.
Hirschkoff, Sidney, to McCulloch Corporation. Snap-acting over-center chain saw safety brake and method of operation thereof. 3,934,345, Cl. 30-381.000.
Hirschson, David. Apparatus for manufacturing neck-ties. 3,935,054, Cl. 156-443.000.
Hirsig, Emil, to Habegger, Willy. Cable connection with slack cable-brake release for an aerial cableway. 3,934,517, Cl. 104-173.000.
Hisanaga, Noboru: *See—*
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Kaji, Tetsunori; and Sato, Kenji, 3,935,590.
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Umino, Tomio; Suzuki, Munenobu; and Shida, Tomohiko, 3,935,417.
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Ho Lee, Yuan. Feeding device for wire stock in a high speed cold heading device. 3,934,293, Cl. 10-13.000.
Hochanadel, Donald L. Compacter for compacting objects such as cans and the like. 3,934,498, Cl. 100-35.000.
Hochiki Kabushiki Kaisha: *See—*
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Hoeffken, Russell W.: *See—*
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Hoeffken, William M.; Hoeffken, Russell W.; and Hoeffken, Paul W. Utility cart and bag holder therefore. 3,934,894, Cl. 280-47.190.
Hoehn, Hans, to E. R. Squibb & Sons, Inc. 1,4,5,7-Tetrahydropyrazolo[3,4-b]pyridin-6-ones. 3,935,222, Cl. 260-295.50B.
Hoerner Waldorf Corporation: *See—*
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Roccaforte, Harry I., 3,934,719.
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Hofmann, Karl; and Mladek, Walter, to Robert Bosch G.m.b.H. Fuel injection nozzle arrangement. 3,934,903, Cl. 285-156.000.
Hogg, Cecil B.: *See—*
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Hohmann, Gerhard: *See—*
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Hollingshead, Donald W.; and Phillips, Cecil E., to Hollingshead, Danny W. Therapeutic musculoskeletal support sleeve and method of manufacturing same. 3,934,583, Cl. 128-165.000.
Holmes, Lloyd H., to E-Systems, Inc. Skid control valve. 3,934,941, Cl. 303-21.00F.
Holschlag, Jerry B., deceased (by Holschlag, Joan D., executrix); and Wilcox, Lyle, to Greenwood Mills. Color measuring spectrophotometer. 3,935,436, Cl. 235-151.350.
Holschlag, Joan D., executrix: *See—*
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Holzgen, Helmut: *See—*
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Homan, John D. Remedy for treatment of hemorrhoids. 3,935,310, Cl. 424-195.000.
Homburg B.V.: *See—*
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Honkawa, Yoshinori, to Ryobi, Ltd. Printed sheet guide mechanism in offset printing press. 3,934,872, Cl. 271-188.000.
Hooker Chemicals & Plastics Corporation: *See—*
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Golborn, Peter; and Duffy, James J., 3,935,162.
Hope, Henry F.; and Hope, Stephen F. Drying rollers. 3,934,354, Cl. 34-9.000.
Hope, Stephen F.: *See—*
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Hopkins, Gorden Lambert, to RCA Corporation. Audio-visual apparatus with control signal operated gating means. 3,935,591, Cl. 360-19.000.
Hord, Joseph B. Triple nipple. 3,934,904, Cl. 285-158.000.
Hori, Fuzio: *See—*
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Hornstein, Maurice, to Intercontinental Trading Company. Arrangement for automatically loading and unloading a machining apparatus. 3,934,375, Cl. 51-101.00R.
Horton, Edward E.; Brewer, John H.; Silcox, William H.; and Hudson, T. A., to Deep Oil Technology, Inc.; and Chevron Oil Field Research Co. Means and methods for anchoring an offshore tension leg platform. 3,934,528, Cl. 114-.50D.
Hoshi, Hiroshi: *See—*
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Houlihan, William J.; and Linder, Jerome, to Sandoz, Inc. Preparation of 1-aryl-4,5-dihalo-pyridazone-6. 3,935,210, Cl. 260-250.00A.
Howard, Albert L. Switch actuator with elongated lever. 3,935,410, Cl. 200-332.000.
Howard, Curtis E.; and Calvin, Douglas G., to Texaco Inc. Method and steam samplers. 3,934,469, Cl. 73-155.000.
Howard, Durrell U., to Sherwood Products Corporation. Apparatus for monitoring the condition of a filter. 3,934,543, Cl. 116-114.0AD.
Howard, G. Wix. Combination ski maintenance tool. 3,934,287, Cl. 7-14.10R.
Howard, Norman Bratton, to Procter & Gamble Company, The. Protein food product. 3,935,319, Cl. 426-104.000.
Howard, Paul L., to Timex Corporation. Energy cell for watch. 3,935,026, Cl. 136-20.000.
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Hozumi, Yukio; Ohi, Akira; and Imai, Tatuhiko, to Daicel Ltd. Styrene-acrylonitrile resin composition having good parting property. 3,935,152, Cl. 260-30.40N.
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Hugot, Andre Albert, to Compagnie Electro Mecanique. Discharge lamp. 3,935,491, Cl. 313-25.000.
Hull, Francis R. High-capacity steam heating system. 3,934,799, Cl. 237-67.000.
Humpa, Norbert J. Disposable utility tongs. 3,934,915, Cl. 294-16.000.
Hunt, Robert P., to Spectrotherm Corporation. Thermograph absolute temperature referencing technique. 3,935,382, Cl. 178-7.100.
Hunter, Joseph P.: *See—*
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Hutcheon, Ronald M., to Atomic Energy of Canada Limited. Two reference cavity structure for frequency tracking as a function of temperature. 3,935,552, Cl. 333-82.00B.
Hutchinson, David Wesley; and Eaton, Michael Anthony William, to G. D. Searle & Co. Polynucleotides of poly(5-hydroxycytidylic acids). 3,935,185, Cl. 260-211.50R.
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Hyler, John H., to Westinghouse Air Brake Company. Elevating-type scraper having forwardly sliding floor and full-width pivoted striker. 3,934,360, Cl. 37-8.000.
Hyler, John H., to Westinghouse Air Brake Company. Elevating-type scraper having forwardly swingable floor section. 3,934,362, Cl. 37-8.000.
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Inaga, Katsu, to Sony Corporation. Reel assembly. 3,934,840, Cl. 242-195.000.

Indrupsky, Lev Iosifovich: *See—*
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Itoh, Susumu; Nishida, Keijiro; Kamiya, Osamu; and Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Three layer anti-reflection film. 3,934,961, Cl. 350-164.000.

Itrich, Earl R., to Itrich, Earl R. Replaceable passenger tabulating and recording card reader unit. 3,935,428, Cl. 235-61.11R.

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Shaw, Clarence W., 3,934,289.

Jabalee, Walter J. Liquid cleaning compositions. 3,935,129, Cl. 252-525.000.

Jachowski, Ronald E., to Decibel Products, Inc. Ferrite circulator. 3,935,549, Cl. 333-1.100.

Jackson, John Maxwell, to Chromax Limited. Machine for printing on cylindrical or frusto-conical containers with ultra-violet-light-setting ink. 3,934,500, Cl. 101-38.00A.

Jackson, Robert E., to Challenge-Cook Bros., Incorporated. Concrete pump valve. 3,934,813, Cl. 251-62.000.

Jackson, Wilbur F., deceased: *See—*
Wolfe, Denis G.; Tyler, Hugh J.; Jackson, Wilbur F., deceased; and Benton, Linda A., trust administrator, 3,934,417.

Jackson, William E., to Goodyear Tire & Rubber Company, The. Method of molding polyurethane articles in a mold coated with three mold release agents. 3,935,291, Cl. 264-331.000.

Jacob, Jose T., to Chemed Corporation. Method and composition for inhibiting corrosion in aqueous systems. 3,935,125, Cl. 252-389.00A.

Jacobs Manufacturing Co., Ltd., The: *See—*
Derbyshire, George C., 3,934,891.

Jacobs, Philip C., Jr.: *See—*
Kozacka, Frederick J.; Knapp, Edward J., Jr.; and Jacobs, Philip C., Jr., 3,935,553.

Jacobsen, Gunter; Fernholz, Hans; and Freudenberger, Dieter, to Hoechst Aktiengesellschaft. Process for the continuous preparation of hydroxypivaldehyde. 3,935,274, Cl. 260-602.000.

Jacobsen, John Kenneth, to Milton Roy Company. Spectrophotometer. 3,935,463, Cl. 250-373.000.

Jaffe, David M., to Automatic Fastener Corporation. Fastening method, apparatus and article. 3,934,325, Cl. 29-243.520.

Jakobson, Karl Folke Olof: *See—*
Rundqvist, Lars-Goran; and Jakobson, Karl Folke Olof, 3,935,109.

Janelid, Erik Ingvar; and Morfeidt, Carl-Olof Oskar. Method of sealing the rock around a rock chamber intended for a medium, the temperature of which is below the natural temperature of the rock. 3,934,420, Cl. 61-.500.

Janes, George Sargent, to Jersey Nuclear-Avco Isotopes, Inc. Method and apparatus for separating laser ionized particles from background ions. 3,935,451, Cl. 250-283.000.

Janjic, Bora. Method of forming a porcelain crown. 3,934,348, Cl. 32-12.000.

Janning, John L., to NCR Corporation. Magnetic spring clutch. 3,934,690, Cl. 192-84.00T.

Janson, Roland C.: *See—*
Campagna, Gary J.; and Janson, Roland C., 3,934,590.

Januszewski, Joseph P.; Cordon, Martin; and Pierson, William Grant, to Colgate-Palmolive Company. Dental creams. 3,935,304, Cl. 424-49.000.

Janycky, Lubomyr. Current auxiliary relay for circuit breaker. 3,935,515, Cl. 317-155.000.

Japan Atomic Energy Research Institute: *See—*
Okubo, Hiroshi; Kato, Masamichi; Kaetsu, Isao; and Ito, Akihiko, 3,935,292.

Jaworek, Dieter: *See—*
Bergmeyer, Hans Ulrich; and Jaworek, Dieter, 3,935,071.

Jefferies, Patrick J.; and Crounse, Nathan N., to Sterling Drug Inc. Water-soluble quaternary ammonium heterocyclic azo dyestuffs. 3,935,182, Cl. 260-155.000.

Jeffers, Frederick J.: *See—*
Condon, John F.; Jeffers, Frederick J.; Duck, Sherman W.; and Bachand, Richard C., 3,935,578.

Jeffries, David: *See—*
de Luca, Peter C.; Stoddart, Hugh F.; and Jeffries, David, 3,935,462.

Jelfo, Raymond L.; Strella, Stephen; and Hamilton, Willard C., to Xerox Corporation. Renewable chow fuser coating. 3,934,547, Cl. 118-60.000.

Jende, Wilhelm, to Pilot Hydraulik GmbH. Apron conveyor. 3,934,712, Cl. 198-195.000.

Jenne, Leonard W., Jr.: *See—*
Doggett, Frederick F.; and Jenne, Leonard W., Jr., 3,935,498.

Jennings, Lewis C., to Morgan Construction Company. Flow monitor for circulating lubrication systems. 3,934,678, Cl. 184-103.00R.

Jennings, Ralph Ernest, to Illinois Tool Works Inc. Tube clamping fastener. 3,934,802, Cl. 248-71.000.

Jerabek, Robert D.; and Marchetti, Joseph R., to PPG Industries, Inc. Method for electrodeposition of self-crosslinking cationic compositions. 3,935,087, Cl. 204-181.000.

Jerome, Jack: *See—*
Kozak, Stephen; Bender, Frederick J.; and Jerome, Jack, 3,934,786.

Jerome Underground Transmission Equipment, Inc.: *See*—
Kozak, Stephen; Bender, Frederick J.; and Jerome, Jack, 3,934,786.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Janes, George Sargent, 3,935,451.
Jespersen, Hans Jorgen; and Nielsen, Leif, to Danfoss A/S. Thermostatic expansion valve for refrigeration installations. 3,934,426, Cl. 62-205.000.
Jirka, Gerhard H.; and Harleman, Donald R. F., to Massachusetts Institute of Technology. Submerged multiport diffusers for cooling water discharge. 3,934,599, Cl. 137-1.000.
Jirka, Howard F., to Zenith Radio Corporation. Network for generating a CRT control signal for enhancing the edges of television images. 3,935,384, Cl. 178-7.50R.
Johansson, Kurt Eilert. Attachment device for a gauge. 3,934,663, Cl. 177-137.000.
Johns-Manville Corporation: *See*—
Lockard, Donald Fredrick, 3,934,905.
Johnson, Chandler A., III, to General Electric Company. DC motor regulator. 3,935,520, Cl. 318-332.000.
Johnson, Clifford E.; Freeburg, Dale O.; and Hyler, John H., to Westinghouse Air Brake Company. Idler construction for earth-moving elevator. 3,934,361, Cl. 37-8.000.
Johnson, Henry Charles, to RCA Corporation. Doppler radar sensor calibrator. 3,935,573, Cl. 343-17.700.
Johnson, Howard R., to Hush Company, Inc. Heat exchanger. 3,934,574, Cl. 126-350.000.
Johnson & Johnson: *See*—
Gorrie, Thomas M., 3,934,582.
Mesek, Frederick K.; Repke, Virginia L.; and Strickel, William R., 3,934,588.
Johnson, Lewis T., to Phillips Petroleum Company. Nest and stack container. 3,934,724, Cl. 206-507.000.
Johnson, Malcolm Ray: *See*—
Goldkuhle, Werner P.; Arnold, Richard E.; and Johnson, Malcolm Ray, 3,934,416.
Johnson, Philip C., to Dentsply Research & Development Corporation. Adjustable operatory chair. 3,934,928, Cl. 297-71.000.
Johnson, Raymond A. Fishing rod holder. 3,934,801, Cl. 248-41.000.
Johnson, Wallace D.: *See*—
Childers, Clifford W.; Clark, Earl; and Johnson, Wallace D., 3,935,136.
Johnston Laboratories, Inc.: *See*—
Waters, John R., 3,935,073.
Johnston, Laird E., to General Motors Corporation. Remote engine water cooler. 3,934,644, Cl. 165-51.000.
Jones, Edward, to Rohm & Haas Company. Textile package of a cellular plastic core with wound yarn. 3,934,767, Cl. 223-106.000.
Jones, Gordon H.; Moffatt, John G.; and Edge, Michael D., to Syntex (U.S.A.) Inc. Synthetic polyoxin type nucleosides. 3,935,184, Cl. 260-211.50R.
Jones, John E.; and Lineback, Lynn D., to Disston, Inc. Cutting blade edge construction for mechanically actuated shears. 3,934,340, Cl. 30-220.000.
Jones, Max E. Gun support. 3,934,768, Cl. 224-1.00R.
Jordan, James J., Jr., to Allied Chemical Corporation. Substituted phenanthroline pigments. 3,935,226, Cl. 260-282.000.
Joseph, Robert W., to Inland Steel Company. Continuous casting process. 3,934,638, Cl. 164-89.000.
Josephsen, Roy C.: *See*—
Wiseman, Donald F.; and Josephsen, Roy C., 3,934,965.
Josten's, Inc.: *See*—
Pirnie, Larry H., 3,934,350.
Jovick, Raymond John, to Rockwell International Corporation. Wheel speed sensor assembly. 3,934,685, Cl. 188-181.00R.
Judd Ringer Corporation: *See*—
Meier, Harold R., 3,934,999.
Juster, Robert W.; and Patton, William E., to Affiliated Hospital Products, Inc. Packaged catheter arrangement. 3,934,721, Cl. 206-364.000.
Justrite Manufacturing Company: *See*—
Flider, Frank S., 3,934,328.
K & B Industries, Inc.: *See*—
Brennan, Martin J.; Klawonn, Vernon D.; and Browne, Edward K., 3,934,520.
Kabb, Harold Louis: *See*—
Glasson, Jerry Marshall; and Kabb, Harold Louis, 3,935,386.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Uhlmann, Otto; and Stephan, Norbert, 3,934,449.
Kabushiki Kaisha Daini Seikosha: *See*—
Matsuura, Eiichi, 3,934,404.
Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Urayama, Kiyoshi, 3,934,762.
Kabushiki Kaisha Morita Seisakusho: *See*—
Matsui, Takahiro; and Uwamori, Osamu, 3,934,931.
Kabushiki Kaisha Seikosha: *See*—
Morozumi, Shinji; and Kodaira, Mitsuharu, 3,935,546.
Nishimura, Izuhiko; and Sano, Tadashi, 3,934,399.
Kabushiki Kaisha Suwa Seikosha: *See*—
Nishimura, Izuhiko; and Morozumi, Shinji, 3,934,400.
Kabushiki Kaisha Tsumura Juntendo: *See*—
Hirano, Satoshi; Tsumura, Jusha; Imaseki, Izumi; and Kawasaki, Yoshimi, 3,935,130.
Kaetsu, Isao: *See*—
Okubo, Hiroshi; Kato, Masamichi; Kaetsu, Isao; and Ito, Akihiko, 3,935,292.
Kaiser Aluminum & Chemical Corporation: *See*—
Baker, Jr.; Bruce A.; and Springer, Willard J., 3,935,085.
Steinke, Theodore D.; and Carter, Melvin A., 3,935,003.
Kaji, Tetsunori; and Sato, Kenji, to Hitachi, Ltd. Apparatus for displaying colored image. 3,935,590, Cl. 358-56.000.
Kakimoto, Yuzo: *See*—
Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Shigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, 3,934,969.
Kalichmann, Isidore: *See*—
Weissberger, David; and Kalichmann, Isidore, 3,935,425.
Kalmanash, Michael H.; and Waehner, Glenn C., to United Technologies Corporation. Modulated energy conservative current supply. 3,935,529, Cl. 323-4.000.
Kalpin, Thomas G.; and Ross, Howard J. Traction-increasing device. 3,934,632, Cl. 152-210.000.
Kaltenbach & Voigt: *See*—
Eibofner, Eugen, 3,934,349.
Kaluza, Eduard, to Wilhelm Linnhoff OHG, Firma. Barrel for treatment in dipping baths, especially a plating barrel. 3,934,548, Cl. 118-418.000.
Kamata, Masamoto: *See*—
Arimura, Tohru; Okado, Masaru; Ichimaru, Takarokuro; and Kamata, Masamoto, 3,934,438.
Kamata, Yasuji; and Katou, Kazuo, to Hitachi, Ltd. DC-to-DC converter. 3,935,526, Cl. 321-2.000.
Kambara, Goro. Flexible belt conveyor system with track-contained roller, carrier and chain assembly. 3,934,708, Cl. 198-109.000.
Kamiya, Osamu: *See*—
Itoh, Susumu; Nishida, Keijiro; Kamiya, Osamu; and Sekimura, Nobuyuki, 3,934,961.
Kampfer, John G., to Halliburton Company. Dual function logging tool and method. 3,935,556, Cl. 340-18.0CM.
Kanai, Tamaki; Yamagishi, Takashi; Ohta, Tetsuya; and Moriyama, Hiroatsu, to Teijin Limited. Aromatic polyester of 2,6 and/or 2,7 naphthalene dicarboxylic acid. 3,935,166, Cl. 260-47.00C.
Kanamark International Limited: *See*—
Sorensen, Karl-Otto; and Sondergaard, Jorgen, 3,935,341.
Kaneko, Hidehiko; Aritomi, Jiro; and Yamato, Yuzuru, deceased (Yamato, Akiko, Hiroshi Yamato, Yumi Yamato, heirs), to Dainippon Pharmaceutical Co., Ltd. ω-[Bis(ω,ω-diphenylalkyl)amino]alkan-ol and their salts. 3,935,268, Cl. 260-570.00R.
Kanij, Johannes Bastiaan Willem; and Noothout, Arend Jaman, to Stichting Reactor Centrum Nederland. Anion-deficient actinide nitrate solution. 3,935,120, Cl. 252-301.10R.
Kanner, Bernard: *See*—
Prokai, Bela; and Kanner, Bernard, 3,935,123.
Kansai Paint Company, Ltd.: *See*—
Muneoka, Harunobu; and Nezu, Tuguo, 3,935,333.
Kapanen, Aarne A.: *See*—
Rautimo, Pentti J.; and Kapanen, Aarne A., 3,935,091.
Kaptein, Eugenius Martinus, to U.S. Philips Corporation. Pulse generator for television for generating at least one pulse series having pulses of different duration and repetition period. 3,935,387, Cl. 178-69.50G.
Karlsson, Frans Harry; and Faxen, Per Torsten, to Hykon-Patent Aktiebolag. Flushing cistern. 3,934,276, Cl. 4-41.000.
Karwat, Heinz, to Linde Aktiengesellschaft. Removal of hydrogen cyanide from acidic gases. 3,935,188, Cl. 423-236.000.
Kashio, Shigetora: *See*—
Morita, Ken-ichi; Kinoshita, Yoshiro; and Kashio, Shigetora, 3,935,301.
Kashiwagi, Teruya: *See*—
Murakami, Masuo; Takahashi, Kozo; Isaka, Ichiro; Ozasa, Teruaki; and Kashiwagi, Teruya, 3,935,198.
Kaspers, Helmut: *See*—
Lunkenheimer, Winfried; Buchel, Karl Heinz; and Kaspers, Helmut, 3,935,312.
Kast, Howard Berdolt, to United States of America, National Aeronautics and Space Administration. Fluid valve with wide temperature range. 3,934,612, Cl. 137-625.300.
Kastl, Hans: *See*—
Muller, Otto; Rottger, Hans; Kastl, Hans; and Hagen, Hans-Gunter, 3,934,731.
Katagiri, Takeo; and Fujiwara, Shinichi, to Nippon Electric Company Limited. Flat-article orienting apparatus for an automatic mail handling system or the like. 3,934,717, Cl. 198-282.000.
Kataoka, Mitsuru: *See*—
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,935,311.
Kato, Masamichi: *See*—
Okubo, Hiroshi; Kato, Masamichi; Kaetsu, Isao; and Ito, Akihiko, 3,935,292.
Katou, Kazuo: *See*—
Kamata, Yasuji; and Katou, Kazuo, 3,935,526.
Kaup, Friedel; and Warnke, Heinrich, to Miele & Cie. Electrophoretic enamelling of ferrous articles. 3,935,088, Cl. 204-181.000.
Kavyarov, Ivan Savvateevich: *See*—
Egorov, Jury Dmitrievich; Kavyarov, Ivan Savvateevich; Samatov, Jury Petrovich; Chasovodov, Nikolai Alexandrovich; and Chirikhin, Jury Ivanovich, 3,934,665.
Kawai, Mituhiro: *See*—
Baba, Yoshio; and Kawai, Mituhiro, 3,935,007.

Kawai, Norio: *See—*
Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Shigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, 3,934,969.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Shigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, 3,934,969.

Kawasaki, Yoshimi: *See—*
Hirano, Satoshi; Tsumura, Jusha; Imaseki, Izumi; and Kawasaki, Yoshimi, 3,935,130.

Kearns, Thomas N.: *See—*
Bruner, A. J.; Foster, Edward T.; and Kearns, Thomas N., 3,934,540.

Keblys, Kestutis A., to Ethyl Corporation. Preparation of cobalt complex. 3,935,228, Cl. 260-270.00J.

Keen, David P. Peening tool. 3,934,443, Cl. 72-75.000.

Kehn, Donald M.: *See—*
Nierode, Dale E.; Kehn, Donald M.; and Kruk, Keith F., 3,934,651.

Keilhack, Hans O.; and Schmidt, Peter, to Keiltex Corporation. Web winder and compensator apparatus. 3,934,837, Cl. 242-75.500.

Keiltex Corporation: *See—*
Keilhack, Hans O.; and Schmidt, Peter, 3,934,837.

Keller, Rudolf: *See—*
Oxe, Josef; and Keller, Rudolf, 3,935,150.

Keller, William B., to Owens-Illinois, Inc. Web centering device. 3,934,775, Cl. 226-196.000.

Keller, Wolfgang; Kruger, Joachim; Ropers, Johann; and Schabert, Hans-Peter, to Siemens Aktiengesellschaft. Nuclear power plant with a safety enclosure. 3,935,062, Cl. 176-30.000.

Kelly, James M.; and Papalos, John G., to Diamond Shamrock Corporation. Leather treating process. 3,934,975, Cl. 8-94.240.

Kelly, Robert J.: *See—*
Dirriwachter, John W.; and Kelly, Robert J., 3,934,557.

Kelsey-Hayes Company: *See—*
Evans, Anthony C., 3,934,684.

Kemmenoe, Adrian Victor: *See—*
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,935,189.
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,935,192.

Kenbridge Holdings Limited: *See—*
Baikie, Hugh E., 3,934,892.

Kennametal Inc.: *See—*
McCreery, James F., 3,934,320.
Stephenson, Earle W.; and Toews, Leonard E., 3,934,654.

Kent, Ronald Allan: *See—*
Fein, Marvin Michael; Colgate, Paul Alexander; and Kent, Ronald Allan, 3,935,128.

Kentaro Hayashi: *See—*
Sugano, Takuo; and Mori, Yoshifumi, 3,935,328.

Kerb, Ulrich: *See—*
Engelfried, Otto; Nieuweboer, Bob; Petzoldt, Karl; Kerb, Ulrich; and Lubke, Klaus, 3,935,245.

Kerner, Karl: *See—*
Zechnall, Richard; Linder, Ernst; Schmid, Albert; Raabe, Gotthold; Kerner, Karl; and Socknick, Rudi, 3,935,444.

Kessler, Milton. Method of making wall-reinforced weatherstrip. 3,935,043, Cl. 156-72.000.

Keyes, Richard M., to Beatrice Foods Co. Dispensing machine. 3,934,427, Cl. 62-342.000.

Kheifets, Rafail Efimovich: *See—*
Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,934,709.

Khromov, Gennady Lvovich; Davydov, Anatoly Borisovich; Maichuk, Jury Fedorovich; and Tischina, Inna Fedorovna. Base for ophthalmological medicinal preparations and on ophthalmological medicinal film. 3,935,303, Cl. 424-14.000.

Kibrick, Morris: *See—*
Lash, Harvey; Kibrick, Morris; and Fox, Shirl S., 3,934,347.

Kicley & Mueller, Inc.: *See—*
Illing, Henry, 3,934,851.

Kiernan, Geoffrey Poulter; and Tinkler, William, to Imperial Chemical Industries Limited. Non-woven fabrics. 3,935,046, Cl. 156-148.000.

Kikuchi, Akira: *See—*
Tomozawa, Akihiro; Nakata, Kensuke; Kikuchi, Akira; and Agastuma, Takashi, 3,935,083.

Kim, James S. H. Toothbrush. 3,934,298, Cl. 15-167.00R.

Kimura, Hiroyuki: *See—*
Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Kimura, Hiroyuki, 3,935,038.

Kimura, Takeji; Oyama, Tomio; Yamada, Haruyasu; Harada, Shuzi; Yoshino, Hirokazu; and Tsuboka, Eiichi, to Matsushita Electric Industrial Co., Ltd. Ghost signal cancellation system. 3,935,536, Cl. 325-476.000.

Kin, Henry, to KRS Industries, Inc. Overhead door for a container having a vertical opening such as a truck trailer. 3,934,635, Cl. 160-189.000.

King, Ian Robert: *See—*
Hardy, Francis R. F.; and King, Ian Robert, 3,935,235.

King, James C.: *See—*
Straffon, Alan E.; and King, James C., 3,935,559.

King-Wilkinson, Inc.: *See—*
Disque, Karl; Holzgen, Helmut; and Stauch, Philipp, 3,935,103.

Kinney, Layton C.; and Tompkins, Edwin H., to IIT Research Institute. Stencil screens. 3,934,503, Cl. 101-128.200.

Kinoshita, Yoshiro: *See—*
Morita, Ken-ichi; Kinoshita, Yoshiro; and Kashio, Shigetora, 3,935,301.

Kinsch, Frank Joseph, to Zenith Radio Corporation. Method of forming a dark, very adherent coating on a CRT mask assembly. 3,935,036, Cl. 148-6.160.

Kioritz Corporation: *See—*
Inaga, Hisashi, 3,934,344.

Kipp, Frederick M. Refrigerated beverage dispenser-mixer. 3,934,758, Cl. 222-108.000.

Kirchmayr, Rudolf: *See—*
Dazzi, Joachim; Kirchmayr, Rudolf; and Dietrich, Henri, 3,935,251.

Kirkland, James L., to United States of America, Navy. Object release device. 3,934,288, Cl. 9-8.00R.

Kirschstein, Horst; Rabenschlag, Frank; Lotz, Dieter; Holland-Cunz, Gerhard; and Blomberg, Hans, to Gebr. Happich GmbH. Drawbending apparatus and method. 3,934,439, Cl. 72-21.000.

Kiselev, Andrei Vladimirovich; Kustova, Galina Lvovna; Lipkind, Boris Alexandrovich; and Nikitin, Jury Stepanovich. Process for preparation of wide-pore adsorbent for use in chromatography. 3,935,299, Cl. 423-338.000.

Kisinko, Paul M.: *See—*
Ostop, John A.; Kisinko, Paul M.; and Henry, Joseph F., 3,935,587.

Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich. Multilayer structure. 3,934,985, Cl. 29-183.500.

Kitano, Naohiko; Haseda, Katsumi; and Takahashi, Tamotsu, to Minolta Camera Kabushiki Kaisha. Drive apparatus for independently changing the phase of the moon for planetarium. 3,934,358, Cl. 35-42.500.

Kitano, Noritoshi: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,935,311.

Kizler, Harald; Przybyla, Bernd; and Schmidt, Peter-Jurgen, to Robert Bosch G.m.b.H. Digital frequency-control circuit. 3,935,538, Cl. 328-38.000.

Kizu, Taisuke: *See—*
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 3,934,429.

Klainos, Michael, to Identification Products Mfg. Co. Multi-image camera. 3,935,580, Cl. 354-121.000.

Klauke, Erich: *See—*
Hempel, Jan; and Klauke, Erich, 3,935,258.

Klauke, Guenter; Marziniak, Ruediger; and Guerke, Guenter, to Siemens Aktiengesellschaft. Soldering bath for fluxless ultrasonic soldering. 3,934,781, Cl. 228-37.000.

Klawonn, Vernon D.: *See—*
Brennan, Martin J.; Klawonn, Vernon D.; and Browne, Edward K., 3,934,520.

Klehm, William G., Jr.: *See—*
Triplett: Gerald H.; Nicol, Edward A.; and Klehm, William G., Jr., 3,935,372.

Klein, Martin: *See—*
Baker, Bernard; and Klein, Martin, 3,935,029.

Klemchuk, Peter P.: *See—*
Spivack, John D.; and Klemchuk, Peter P., 3,935,163.
Spivack, John d.; and Klemchuk, Peter P., 3,935,164.

Klemm, Martin, to Fritz Buser AG., Maschinenfabrik. Method for photo-mechanical composition of designs on stencils for film and screen printing, particularly rotary screen printing. 3,934,504, Cl. 101-128.300.

Kliklok Corporation: *See—*
Baker, Thomas R., 3,934,916.

Klimek, Boleslaw, to Berg Manufacturing Company, The. Dual circuit brake valve. 3,934,942, Cl. 303-52.000.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. Dialkylaminomethylphenols as catalyst deactivators for stereoregular diene polymers. 3,935,160, Cl. 260-45.8NT.

Klotzer, Sieghart; and Moisar, Erik, to Agfa-Gevaert Aktiengesellschaft. Direct-positive photographic emulsion containing, unfogged, monodispersed silver halide grains having a layered grain structure of specific silver chloride content. 3,935,014, Cl. 96-64.000.

Knapp, Edward J., Jr.: *See—*
Kozacka, Frederick J.; Knapp, Edward J., Jr.; and Jacobs, Philip C., Jr., 3,935,553.

Kobayashi, Akihiro: *See—*
Sasaki, Koju; and Kobayashi, Akihiro, 3,935,492.

Kobayashi, Yorimasa: *See—*
Ogasawara, Takahisa; Kobayashi, Yorimasa; Mizutani, Kiyokazu; Nakagawa, Teruo; Hisanaga, Noboru; and Tatemichi, Hidemaro, 3,935,173.

Kober AG, Firma: *See—*
Koster, Waldemar; and Huber, Reinhold, 3,934,295.

Kodaira, Mitsuharu: *See—*
Morozumi, Shinji; and Kodaira, Mitsuharu, 3,935,546.

Koeller, Fred B.: *See—*
Hamilton, Charles Howard; Koeller, Fred B.; Raymond, Roger S.; and Goldberg, Martin, 3,934,441.

Koenig, Karl-Heinz: *See—*
Mangold, Dietrich; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 3,935,201.
Koernig, Wolfgang: *See—*
Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, 3,935,161.
Koga, Sigeyuki, to Trio Kabushiki Kaisha. Oval dome type speaker. 3,935,400, Cl. 179-115.50R.
Kohn, Herbert: *See—*
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Koller, Erwin: *See—*
Stadlbauer, Wilhelm; Kump, Walter; and Koller, Erwin, 3,934,388.
Kollmorgen Corporation: *See—*
Burr, Robert P., 3,935,521.
Komarek, James A., to Hycom Incorporated. Phase logic. 3,935,474, Cl. 307-205.000.
Kondo, Toru. Tape recorder with cartridge selecting means. 3,935,595, Cl. 360-92.000.
Konno, Mitinobu: *See—*
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Kono, Minoru: *See—*
Sugiura, Shotaro; Matsuura, Tetsuro; Ueno, Haruo; Kono, Minoru; Ishikawa, Hideo; and Tokutomi, Thunehiko, 3,935,180.
Koppers Company, Inc.: *See—*
Greco, Nicholas P., 3,935,283.
Korovin, Stanislav Konstantinovich; Kruglov, Igor Ivanovich; Preobrazhentsev, Konstantin Andreevich; Sidorov, Jury Ivanovich; and Fronk, Stanislav Vladislavovich. Semiconductor diode with voltage-dependent capacitance. 3,935,585, Cl. 357-14.000.
Korytkowski, Henry M.: *See—*
Bagen, Herbert John; Ferguson, Ronald Worden; Korytkowski, Henry M.; and Mowry, William H., Jr., 3,934,501.
Kossa, Miklos M.; and Seymour, David J., to Inter-Hull. Transport vessel for floating onloading and offloading of cargo. 3,934,530, Cl. 114-43.5VC.
Koster, Waldemar; and Huber, Reinhold, to Kober AG, Firma. Rocker bearing for bridges on similar structures. 3,934,295, Cl. 14-16.000.
Kothari, Vipin M., to Goodyear Tire & Rubber Company, The. Oxidation of alkylated phenols to p-benzoquinones. 3,935,247, Cl. 260-396.00R.
Kovacs, Odon Kalman Jozsef: *See—*
Dahlen, Sven Erik; Ekstrom, Bertil Ake; Kovacs, Odon Kalman Jozsef; and Sjoberg, Berndt Olof Harald, 3,935,204.
Koval, Leonide P., to General Electric Company. Current-limiting circuit breaker. 3,935,409, Cl. 200-153.00G.
Kovalick, Albert W., to Hewlett-Packard Company. Method and apparatus for enhancing and maintaining character quality in thermal printers. 3,934,695, Cl. 197-1.00R.
Koyama, Masao; Okada, Noboru; and Ogawa, Masahiro, to Yokohama Rubber Co., Ltd., The. Apparatus for splicing parallelogrammatic pieces of rubber cloth without overlap. 3,935,056, Cl. 156-507.000.
Kozacka, Frederick J.; Knapp, Edward J., Jr.; and Jacobs, Philip C., Jr. Cartridge fuse for d-c circuits. 3,935,553, Cl. 337-159.000.
Kozak, Stephen; Bender, Frederick J.; and Jerome, Jack, to Jerome Underground Transmission Equipment, Inc. Method and apparatus for splicing and welding stranded electrical cables. 3,934,786, Cl. 228-138.000.
Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant aqueous emulsion copolymer additives. 3,935,149, Cl. 260-29.6TA.
Kramer, Friedhelm; and Wolfertz, Gunter, to Schaeffer-Homberg GmbH, Firma. Machine for the attachment of fasteners. 3,934,777, Cl. 227-109.000.
Krammer, Herbert: *See—*
Cap, Heinrich; Krammer, Herbert; and Scheiber, Robert, 3,935,524.
Kratochvil, John R., Jr., to Boise Cascade Corporation. Suspension box for shipping furniture. 3,934,720, Cl. 206-326.000.
Kravcik, John W.: *See—*
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Kreidl Chemico Physical K.G., The: *See—*
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Kreitsberga, Yana Nikolaevna: *See—*
Neiland, Oyar Yanovich; and Kreitsberga, Yana Nikolaevna, 3,935,239.
Kress, Heinz; and Heckmanns, Heinz, to Titan Verpackungssysteme GmbH. Junction for sheet-like material load lifting band with overload indicator. 3,934,918, Cl. 294-74.000.
Kristiansen, Odd: *See—*
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Krohn, David A.: *See—*
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KRS Industries, Inc.: *See—*
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Kruger, Joachim: *See—*
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Kruk, Keith F.: *See—*
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Kruse, Walter M., to ICI United States Inc. Homogeneous hydrogenation of saccharides using ruthenium triphenyl phosphine complex. 3,935,284, Cl. 260-635.00C.
Kucsan, John S.: *See—*
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Kudo, Ken-ichi; Ohmae, Tadayuki; and Uno, Akihiko, to Sumitomo Chemical Company, Ltd. Process for preparation of α-naphthol. 3,935,282, Cl. 260-621.00H.
Kudo, Teizo; Hashizume, Yoshio; Mikumo, Masatoshi; and Itoh, Masanori, to Daicel Ltd. Process for preparing styrene resins containing polyester plasticizers. 3,935,153, Cl. 260-31.600.
Kuhlmann-Schafer, Wilhelm H., to Preussag Aktiengesellschaft. Zone melting process. 3,935,058, Cl. 156-602.000.
Kuhlmann, Wolf, to SKF Industrial Trading and Development Company, B.V. Bearing for high speed rotary shafts. 3,934,950, Cl. 308-10.000.
Kuhn, Hans Georg. Wrapping material. 3,935,355, Cl. 24-150.00R.
Kuhn, Hans-Robert, to Electroacustic GmbH. Display device for varying the shape and cross-section of a rectangular area. 3,934,364, Cl. 40-28.00R.
Kuiper, Johannes H. A.: *See—*
Crommentuyn, Gerardus J.; and Kuiper, Johannes H. A., 3,935,009.
Kulka, Helen C. Animal shelter with plural openings. 3,934,552, Cl. 119-19.000.
Kump, Walter: *See—*
Stadlbauer, Wilhelm; Kump, Walter; and Koller, Erwin, 3,934,388.
Kunz, Emil, to Dr. -Ing H.c.F. Porsche Aktiengesellschaft. Synchronization mechanism for change-speed transmissions of motor vehicles. 3,934,689, Cl. 192-53.00C.
Kuo, Yu-Neng: *See—*
Higuchi, Takeru; Bodor, Nicolae S.; and Kuo, Yu-Neng, 3,935,196.
Kupper, Willi, to W. Schlafhorst & Co. Supply container with conveyor belt for receiving and suitably orienting textile coils or the like. 3,934,718, Cl. 198-287.000.
Kuramochi, Shigeaki. Shift mechanism for typewriter apparatus. 3,934,697, Cl. 197-72.000.
Kurashige, Yasushi: *See—*
Hashimoto, Sadao; Sakakibara, Ryuji; Kurashige, Yasushi; Takikawa, Katsuo; Osame, Yoko; Minami, Hiroshi; and Suzue, Takashi, 3,935,266.
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Uchikawa, Shoji, 3,935,481.
Yoshida, Masafumi; Segawa, Masahiro; and Obara, Hiroshi, 3,935,485.
Kurkjian, Gregory A., Jr., to Henry Pratt Company. Adjustable valve seat. 3,934,850, Cl. 251-171.000.
Kushner, David, to Bernard Screen Printing Corporation. Method and apparatus for synchronous printing of a moving web. 3,934,505, Cl. 101-129.000.
Kustova, Galina Lvovna: *See—*
Kiselev, Andrei Vladimirovich; Kustova, Galina Lvovna; Lipkind, Boris Alexandrovich; and Nikitin, Jury Stepanovich, 3,935,299.
Kuwana, Kazutaka; and Amano, Hiroyuki, to Aisin Seiki Kabushiki Kaisha. Method, circuit, and apparatus for anti-skid brake control in motor vehicles. 3,934,938, Cl. 303-21.00P.
Kwan, Gerald A.; Penkov, Walter V.; and Roe, Norman E., to Hehr International Inc. Panel operating mechanism. 3,934,370, Cl. 49-341.000.
Kwon, Young Doo: *See—*
Prevorsek, Dusan Cyril; Kwon, Young Doo; and Sharma, Raj Kumar, 3,934,452.
LaBate, Micheal Donald. Device for supplying a treating agent to molten metal in a ladle. 3,934,862, Cl. 266-34.00T.
Laboratoires Jacques Logeais: *See—*
Maillard, Jacques Georges, 3,935,255.
Lacina, William B.: *See—*
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Lacour, Bernard: *See—*
Godard, Bruno; Lacour, Bernard; and Gaffard, Jean-Paul, 3,935,544.
Laforest, Jacqueline: *See—*
Thuillier, Germaine; and Laforest, Jacqueline, 3,935,203.
LaFortune, Robert G. J., to Diamond Shamrock Corporation. Recovery of natural gas during solution mining of an underground salt deposit. 3,934,650, Cl. 166-267.000.
La Hue, Richard W.; and Hogg, Cecil B., to Catalysts and Chemicals, Inc. Process for removing chlorine-containing compounds from hydrocarbon streams. 3,935,295, Cl. 423-240.000.
Laing, Nikolaus. Controllable heat pipe. 3,934,643, Cl. 165-32.000.
Laliccia, Federico R.: *See—*
Barsellotti, John A.; McNeilly, Joseph H.; Laliccia, Federico R.; and Pinede, Edouard, 3,935,396.

Lamb, Harry H., II. Linear telethermometer. 3,934,476, Cl. 73-362.0AR.

Lambert, Emmanuel; Lambert, Jean-Louis; and De Longueville, Bernard, to Glaverbel-Mecaniver S.A. Severing of glass or vitrocrystalline bodies. 3,935,419, Cl. 219-121.0LM.

Lambert, Jean-Louis: *See—*
Lambert, Emmanuel; Lambert, Jean-Louis; and De Longueville, Bernard, 3,935,419.

Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,935,206, Cl. 260-247.10E.

Lambie, Jack H.: *See—*
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Lambiris, Sotiris: *See—*
Freeman, James M., Jr.; Gans, Bruce E.; Lambiris, Sotiris; and Woodmansee, Donald E., 3,934,553.

Lambly, Charles A. R.; and Draney, Charles T., to Bechtel International Corporation. Hydraulic mining of oil bearing formation. 3,934,935, Cl. 299-2.000.

Lampietti, Bernard, to Torin Corporation. Dual purpose spring coiling machine. 3,934,445, Cl. 72-129.000.

Landau, Mark I.: *See—*
Broniwitz, Laurence E.; Landau, Mark I.; and Pearson, John B., III, 3,935,572.

Landheer, Frits; and Wilting, Hermanus Josephus Henricus, to U.S. Philips Corporation. Semiconductor device having a Schottky junction and method of manufacturing same. 3,935,586, Cl. 357-15.000.

Lane, Clinton F., to Aldrich-Boranes, Inc. Reduction of amino acids in the presence of boron trifluoride. 3,935,280, Cl. 260-618.00H.

Lange, erhard, to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid. Method of and apparatus for producing particularly high-strength chains. 3,934,407, Cl. 59-31.000.

Lange, Paul F.: *See—*
Terrell, Melvin L.; Lange, Paul F.; and Doolittle, James B., 3,934,816.

Langen, Ben G.: *See—*
Michels, Paul W.; and Langen, Ben G., 3,934,860.

Langlois, Christian, to Regie Nationale des Usines Renault. Automatic balancing machines. 3,934,963, Cl. 408-2.000.

Langwell, John D. Means for detachable support of keys within a pocket of an article of clothing. 3,934,317, Cl. 24-237.000.

Laporte Industries Limited: *See—*
Hardy, Francis R. F.; and King, Ian Robert, 3,935,235.

Larco Societe Miniere et Metallurgique de Larymna S.A.: *See—*
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Larker, Hans, to Allmanna Svenska Elektriska Aktiebolaget. Press for hydrostatic extrusion. 3,934,442, Cl. 72-60.000.

Larrison, John E. Multiface wire bonding method and tool. 3,934,783, Cl. 228-110.000.

Larsen, Elizabeth. Collapsible bicycle article carrier. 3,934,770, Cl. 224-33.000.

Larsh, Everett P. Marine vessel roll stabilizer apparatus. 3,934,534, Cl. 114-122.000.

Larson, William M.: *See—*
Bender, Newell R.; and Larson, William M., 3,935,051.

Lash, Harvey; Kibrick, Morris; and Fox, Shirl S., to Lash Oral Implants. Dental prosthetic structure and method. 3,934,347, Cl. 32-10.00A.

Lash Oral Implants: *See—*
Lash, Harvey; Kibrick, Morris; and Fox, Shirl S., 3,934,347.

Lasier, Thomas R.; and Pollack, Roy. Spring adjustment mechanism. 3,934,307, Cl. 16-79.000.

Laszlo, Lajos George. Playing surface structure for spinning top pin games. 3,934,880, Cl. 273-108.000.

Lauterwald, Rolf: *See—*
Bleibtreu, Alexander; and Lauterwald, Rolf, 3,935,407.

Lavon, Erik Volmar, to Atlas Copco Aktiebolag. Method of and arrangement for feeding pressure fluid in pulses. 3,934,601, Cl. 137-14.000.

Law, Jack. Key safe apparatus. 3,934,434, Cl. 70-63.000.

Lawrence, John Pennington: *See—*
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Lawrence Peska Associates, Inc.: *See—*
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Satkin, Jeff, 3,934,329.
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Leach, John Meredith. Material handling conveyor. 3,934,710, Cl. 198-143.000.

Lear Avia Corporation: *See—*
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Lear, William P., to Lear Avia Corporation. Jet engine noise suppressor. 3,934,675, Cl. 181-33.0HC.

LeBus International, Inc.: *See—*
Goldkuhle, Werner P.; Arnold, Richard E.; and Johnson, Malcolm Ray, 3,934,416.

Lee, Jerald Dana, to Du Pont de Nemours, E. I., and Company. Electron collection in electron spectrometers. 3,935,454, Cl. 250-305.000.

Leggett & Platt, Incorporated: *See—*
Sandham, Edwin C., 3,934,930.

Le Gresley, Edsel. Retractable and vented pouring spout. 3,934,760, Cl. 222-153.000.

Legris, Andre, to Societe Legris France S.A. Modular distributor box for fluids. 3,934,605, Cl. 137-271.000.

Lehnert, Gunther; Maertens, Dieter; and Zimmermann, Manfred, to Bayer Aktiengesellschaft. Process for the ring opening polymerisation of cyclooctadiene-(1-5). 3,935,178, Cl. 260-88.20D.

Lehr, Glen J.: *See—*
Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 3,935,032.

Leisterer, Reinhard; Mahlstedt, Walter; and Rubel, Manfred, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Circuitry for determining direction of impingement of a received signal. 3,935,575, Cl. 343-113.00R.

Leistner, Werner: *See—*
Spirk, Franz; and Leistner, Werner, 3,935,488.

Lekarski, Simeon: *See—*
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Leland Stanford, Jr. University, The Board of Trustees of: *See—*
Quate, Calvin F.; and Grudkowski, Thomas W., 3,935,564.

Lelental, Mark, to Eastman Kodak Company. Electroless deposition of a copper-nickel alloy on an imagewise pattern of physically developable metal nuclei. 3,935,013, Cl. 96-48.0PD.

Leliaert, Raymond M.; and Snyder, Clyde A., to Wheelabrator-Frye, Inc. Portable surface treating apparatus. 3,934,373, Cl. 51-9.00M.

Leliaert, Raymond M., to Wheelabrator-Frye, Inc. Sand reclamation system. 3,934,374, Cl. 51-9.00R.

Lem Instrument Corporation: *See—*
Samuel, Joseph, 3,935,568.

Lema, Luis E., to Unitrode Corporation. Electroless plating of peroxide forming metals. 3,935,345, Cl. 427-383.000.

Lemay, Rejean P.: *See—*
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Leng, John Lindley: *See—*
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Les Parfums de Dana, Inc.: *See—*
Gentreau, Guy Rene, 3,934,761.

Leschek, Walter C.; and Carpentier, Philip E., to Westinghouse Electric Corporation. Replaceable acoustic transducer assembly. 3,935,484, Cl. 310-8.200.

Lesko, Richard; and Reynolds, David, to Torin Corporation. Apparatus for stress relieving springs and the like. 3,935,413, Cl. 219-50.000.

Lestina, Gregory James; and Bush, Walter Monroe, to Eastman Kodak Company. Oxichromic compounds, stabilized oxichromic compounds and processes for preparing same. 3,935,262, Cl. 260-559.00R.

Lestina, Gregory James; and Bush, Walter Monroe, to Eastman Kodak Company. Oxichromic compounds, stabilized oxichromic compounds and processes for preparing same. 3,935,263, Cl. 260-559.00R.

Leute, Richard K.: *See—*
Rubenstein, Kenneth Edward; and Leute, Richard K., 3,935,074.

Le Vasseur, Kenneth W. Swimming system. 3,934,290, Cl. 9-309.000.

Levenson, Michael K.: *See—*
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Lever Brothers Company: *See—*
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Levine, Barry Franklin: *See—*
Bethea, Clyde G.; Levine, Barry Franklin; and Logan, Ralph Andre, 3,935,472.

Levy, Murray N.; and Gasparino, Vincent J., to Adolph Gottscho, Inc. Apparatus for imprinting intermittently advanced webs. 3,934,506, Cl. 101-260.000.

Lewis, David E.; and Gossard, Thomas F., to Columbia Pictures Industries, Inc. Converter-tuner for information transmission system. 3,935,534, Cl. 325-308.000.

Lian, Ragnar. Loud speakers. 3,935,399, Cl. 179-115.5VC.

Libbey-Owens-Ford Company: *See—*
Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 3,935,032.

Lieberman, Hillel; Graffeo, Anthony J.; and Kucsan, John S., to Betz Laboratories, Inc. Foam control compositions for aqueous systems, its preparation, and process using same. 3,935,121, Cl. 252-321.000.

Liebl, Helmut, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Quadrupole field mass analyser. 3,935,453, Cl. 250-292.000.

Lienard, Maurice: *See—*
Penicaud, Etienne; and Lienard, Maurice, 3,935,403.

Lieptz, Nathan S., to Curtis Noll Corporation. Retractable stacker guard. 3,934,679, Cl. 187-1.00R.

Lightenstein, Bernard: *See—*
Beretsky, Irwin; and Lightenstein, Bernard, 3,934,458.

Lilja, Duane F. Fluid product reservoir. 3,934,746, Cl. 215-232.000.

Lim, Drahoslav, to Merck Patent Gesellschaft mit beschrankter Haftung. Hydrophilization of non-polar surfaces. 3,935,342, Cl. 427-341.000.

Lind, Erwin, to Hoechst Aktiengesellschaft. Electrophotographic process having developed hydrophilic image areas. 3,935,008, Cl. 96-1.400.

Linde Aktiengesellschaft: *See—*
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Linder, Ernst: *See—*
Zechnall, Richard; Linder, Ernst; Schmid, Albert; Raabe, Gotthold; Kerner, Karl; and Socknick, Rudi, 3,935,444.

Linder, Jerome: *See—*
Houlihan, William J.; and Linder, Jerome, 3,935,210.

Linder, John L., to United States of America, Navy. A-C signal multiplying circuit by a ratio of whole numbers the numerator of which is greater than one and greater than the denominator. 3,935,539, Cl. 328-38.000.

Lineback, Lynn D.: *See—*
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Lion Yushi Kabushiki Kaisha: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,935,340.

Lipkind, Boris Alexandrovich: *See—*
Kiselev, Andrei Vladimirovich; Kustova, Galina Lvovna; Lipkind, Boris Alexandrovich; and Nikitin, Jury Stepanovich, 3,935,299.

Lipner, Herbert D. Water filter assembly. 3,935,106, Cl. 210-232.000.

Lippman, Alfred; Toth, Charles; and Sebenik, Roger Frank, to Toth Aluminum Corporation. Carbo chlorination of $AlPO_4$. 3,935,297, Cl. 423-304.000.

Lissaman, Peter B. S.; and Lambie, Jack H., to Aerovironment Inc. Air decelerator for truck cab. 3,934,923, Cl. 296-1.00S.

Lissaman, Peter B. S.: *See—*
MacCready, Paul B, Jr.; and Lissaman, Peter B. S., 3,934,922.

Little, Steven M.; Gerber, Robert L.; Heller, Carl A.; and Esposito, Vincent J., to United States of America, Navy. Chemiluminescent foldable signal device. 3,934,539, Cl. 116-63.00P.

Litton Systems Inc.: *See—*
Coutant, Ralph W., 3,934,711.

Livesay, Robert H.: *See—*
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Lobeck, Walter G.: *See—*
Wu, Yao Hua; and Lobeck, Walter G., 3,935,199.

Lockard, Donald Fredrick, to Johns-Manville Corporation. Expansion joint. 3,934,905, Cl. 285-229.000.

Locke, John Michael: *See—*
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Lockheed Missiles & Space Company, Inc.: *See—*
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Lodge & Shipley Company, The: *See—*
Rowekamp, Edward F., 3,934,920.

Loeffler, Otto Ernest, to NL Industries, Inc. Trivalent antimony catalyst. 3,935,170, Cl. 260-75.00R.

Logan, Ralph Andre: *See—*
Bethea, Clyde G.; Levine, Barry Franklin; and Logan, Ralph Andre, 3,935,472.

Logan, Robert E.: *See—*
Dorfman, Michael B.; and Logan, Robert E., 3,935,361.

Loken, Bjarte, to Omni Research Incorporated. Separation of hecogenin-tigogcnin mixtures. 3,935,194, Cl. 260-239.55A.

London & Scandanavian Metallurgical Co., Limited: *See—*
Barfield, Leslie Theodore, 3,934,988.

Long, Anthony J. Therapeutic seat pad for automobiles. 3,934,933, Cl. 297-384.000.

Long, John C. Passenger restraint device. 3,934,898, Cl. 280-150.00B.

Long, Margaret Esther, to R. J. Reynolds Tobacco Company. Enzymatic process using immobilized microbial cells. 3,935,069, Cl. 195-31.00F.

Loschilin, Evgeny Dmitrievich; Galperin, Alexandr Lvovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and Sakharov, Boris Alexandrovich. Apparatus for guiding weft thread carriers through the shed of a loom of the successive shedding tyre. 3,934,619, Cl. 139-12.000.

Lotz, Dieter: *See—*
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Louie, Anthony C. H.: *See—*
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Lovell, Walter C. Safety bottle cap. 3,934,745, Cl. 215-224.000.

Lubke, Klaus: *See—*
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Lucas Electrical Company Limited, The: *See—*
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Lucas, Theodore W., Jr.: *See—*
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Lugli, Gabriele; Mazzei, Alessandro; and Brandi, Gabriella, to Snam Progetti S.p.A. Process for the polymerization of unsaturated compounds. 3,935,175, Cl. 260-82.100.

Lukomskyj, Paul; and Gamble, Donald James. Segmented rigid insulated conduit. 3,934,615, Cl. 138-111.000.

Lummus Company, The: *See—*
Riegel, Herbert, 3,935,288.

Lunkenheimer, Winfried; Buchel, Karl Heinz; and Kaspers, Helmut, to Bayer Aktiengesellschaft. Combating fungi with imidazo-[4,5-b]quinoxalines. 3,935,312, Cl. 424-250.000.

Luthi, Walter, to Werkzeugmaschinenfabrik Oberlikon-Buhrle AG. Feed apparatus. 3,934,483, Cl. 74-424.80R.

Lutz, Walter A., to Parker-Hannifin Corporation. Bi-directional rotary shaft seal. 3,934,888, Cl. 277-134.000.

Mabuchi, Kenichi. Portable, multi-purpose, rechargeable cigarette lighter. 3,934,302, Cl. 15-339.000.

MacCready, Paul B, Jr.; and Lissaman, Peter B. S., to Aerovironment Inc. Aerodynamic drag reduction devices for surface vehicles. 3,934,922, Cl. 296-1.00S.

Macro Industries, Inc.: *See—*
Bracken, Thomas W., 3,935,579.

Madrange nee Dermain, Annie; and Papantoniou, Christos, to Societe Anonyme dite: L'Oreal. Lacquers and wavesetting lotions containing methyl methacrylate-dimethylamino-ethyl methacrylate-octadecyl methacrylate terpolymers. 3,934,595, Cl. 132-7.000.

Maeda, Toshinobu: *See—*
Arimoto, Kazuyuki; Maeda, Toshinobu; Hori, Fuzio; and Takata, Akihiko, 3,935,483.

Maeda, Toshinori: *See—*
Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Maeda, Toshinori, 3,935,349.

Maertens, Dieter: *See—*
Lehnert, Gunther; Maertens, Dieter; and Zimmermann, Manfred, 3,935,178.

Magne-Lok Co., The: *See—*
Rifkin, Michael, 3,934,908.

Magor, James K.: *See—*
Camacho, Salvador L.; and Magor, James K., 3,935,371.

Mahlstedt, Walter: *See—*
Leisterer, Reinhard; Mahlstedt, Walter; and Rubel, Manfred, 3,935,575.

Maichuk, Jury Fedorovich: *See—*
Khromov, Gennady Lvovich; Davydov, Anatoly Borisovich; Maichuk, Jury Fedorovich; and Tischina, Inna Fedorovna, 3,935,303.

Maillard, Jacques Georges, to Laboratoires Jacques Logeais. Phenylacetic acid derivatives. 3,935,255, Cl. 260-518.00R.

Maleck, Leroy R.: *See—*
Malek, Raymond P.; and Maleck, Leroy R., 3,934,757.

Malek, Raymond P.; and Maleck, Leroy R., to Container Corporation of America. Refrigerator water dispenser with child-proof guard. 3,934,757, Cl. 222-76.000.

Males, Robert E., to Textron, Inc. Staple driving device with improved staple jam clearing mechanism. 3,934,778, Cl. 227-123.000.

Mallin, Sidney. Liquid chemical evaporator for flush tanks. 3,934,279, Cl. 4-228.000.

Mallion, Keith Blakeney, to Imperial Chemical Industries Limited. Cyclopentylheptenoic acids and derivatives. 3,935,240, Cl. 260-469.000.

Malo, Lowell L., to ACF Industries, Incorporated. Method of assembling boxcar end structure. 3,934,785, Cl. 228-135.000.

Malyshev, Leonid Mikhailovich; Indrupsky, Lev Iosifovich; Gusev, Boris Pavlovich; and Pisman, Yakov Borisovich. Crankshaft governor of an internal combustion engine. 3,934,568, Cl. 123-140.00R.

Mangold, Dietrich; Koenig, Karl-Heinz; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. Production of 2,1,3-benzothiadiazin-4-one-2,2-dioxides. 3,935,201, Cl. 260-243.00R.

Mann, Michael M.: *See—*
Eguchi, Ronald G.; Mann, Michael M.; Lacina, William B.; and Crill, Kay C., 3,935,543.

Manoury, Alain: *See—*
Marcel, Francois; and Manoury, Alain, 3,935,569.

Manoury, Philippe Michel Jacques: *See—*
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Manoury, Philippe Michel Jacques; and Dumas, Andre Pierre Fernand, 3,935,229.

Manson, John Stuart; and Ridyard, Denis Robert Annesley, to Imperial Chemical Industries Limited. Anthraquinone dyes. 3,935,248, Cl. 260-378.000.

Marcel, Francois; and Manoury, Alain, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Digital coder. 3,935,569, Cl. 340-347.0AD.

Marchetti, Joseph R.: *See—*
Jerabek, Robert D.; and Marchetti, Joseph R., 3,935,087.

Margolies, Arthur, to GTE Laboratories Incorporated. Two-phase MOS synchronizer. 3,935,475, Cl. 307-208.000.

Marino, Thomas J., to Morrison Machine Co. Adjustable rotary screen printer with air-biased squeegees. 3,934,502, Cl. 101-115.000.

Marlow, Darrell W.; and Freeman, Brady L., to Olin Corporation. Gas generator. 3,934,984, Cl. 23-281.000.

Marni S.A.: *See—*
Davidsohn, Alfred, 3,935,237.

Marsch, Hans-Dieter, to Friedrich Uhde GmbH. Device for performing catalytic endothermic reactions. 3,935,225, Cl. 23-289.000.

Marsden, John Thomas, to Expert Industrial Controls Ltd. Fluid control valves. 3,934,815, Cl. 251-129.000.

Marti, Toni, to Societe de la Viscose Suisse. Process for preparing flock fibers for electrostatic flocking. 3,935,370, Cl. 428-394.000.

Martin, Fred E.: *See—*
Shippey, Frank R.; Vance, Timothy C.; and Martin, Fred E., 3,934,906.

Martin, Leon C. Bale carrier. 3,934,726, Cl. 214-131.00A.

Martin, Michel: *See—*
Biola, Georges; Buathier, Bernard; Combes, Andre; and Martin, Michel, 3,935,276.

Martin, Paul S.: *See—*
Shore, Sidney X.; and Martin, Paul S., 3,934,674.
Shore, Sidney X.; and Martin, Paul S., 3,935,401.

Maruyama, Isamu; Suzuki, Shigeyoshi; and Yoshihiro, Yoshitake, to Mitsubishi Paper Mills, Ltd. Method for producing support for electrophotographic material and electrostatic recording material. 3,935,335, Cl. 427-121.000.

Marvel, Carl S.; and Samyn, Celeste, to University Patents, Inc. Acetylenic polymers, trimers thereof and the production thereof. 3,935,167, Cl. 260-49.000.

Marwede, Gunter: *See—*
Muller, Eberhard; and Marwede, Gunter, 3,935,177.

Maryland Cup Corporation: *See—*
Tiernan, Stanton W.; and Epple, Richard R., 3,934,625.
Marziniak, Ruediger: *See—*
Klauke, Guenter; Marziniak, Ruediger; and Guerke, Guenter, 3,934,781.
Masaki, Kenji; and Konno, Mitinobu, to Nissan Motor Company Limited. System for reducing pollutants in engine exhaust gas. 3,934,411, Cl. 60-286.000.
Masaki, Kenji; and Nagaishi, Hatuo, to Nissan Motor Company Limited. Thermal reactor for afterburning automotive internal combustion engine exhaust gases. 3,934,412, Cl. 60-288.000.
Masaoka, Hiroshi: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, 3,934,321.
Maschinenfabrik Reinhausen Gebruder Scheubeck K.G.: *See—*
Bleibtreu, Alexander; and Lauterwald, Rolf, 3,935,407.
Maschinenfabrik Schweiter AG: *See—*
Heckel, Rene, 3,934,716.
Maschinenfabrik Wifag: *See—*
Heimlicher, Paul, 3,934,508.
Maskell, Roy: *See—*
Cowles, Richard H.; De Franco, Thomas P.; and Maskell, Roy, 3,935,497.
Mason, Donald R., to Harris Corporation. Process for forming monolithic semiconductor display. 3,935,040, Cl. 148-175.000.
Mason, John L.: *See—*
Ruest, Dennis A.; Shen, C. Y.; and Mason, John L., 3,935,257.
Massachusetts Institute of Technology: *See—*
Dahlen, John M.; Toth, William E.; Shillingford, John T., Jr.; and McKenna, John F., Jr., 3,935,592.
Jirka, Gerhard H.; and Harleman, Donald R. F., 3,934,599.
Massucco, Arthur A.: *See—*
Merrill, Richard E.; and Massucco, Arthur A., 3,935,367.
Mata, Justo Martinez: *See—*
Hendlin, David; Mata, Justo Martinez; Del Val, Sagrario Mochales; and Stapley, Edward O., 3,935,309.
Matoba, Kazuo: *See—*
Togawa, Kinmochi; Matoba, Kazuo; Takao, Hiroshi; and Hata, Yoshitaka, 3,935,089.
Matsui, Takahiro; and Uwamori, Osamu, to Kabushiki Kaisha Morita Seisakusho. Dental chair. 3,934,931, Cl. 297-319.000.
Matsukata, Kosuke. Precision piece selector on gramaphone record. 3,934,884, Cl. 274-9.0RA.
Matsumoto, Hirohumi; and Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Choke control system for carburetors. 3,934,565, Cl. 123-119.00F.
Matsumoto, Takao, to Yamamura Glass Kabushiki Kaisha. Method and apparatus for regulating orientation of containers or the like. 3,934,714, Cl. 198-244.000.
Matsumoto, Yoshimitsu: *See—*
Tanaka, Masaru; Matsumoto, Yoshimitsu; and Oku, Takeshi, 3,935,530.
Matsuo, Syunsuke: *See—*
Ooyama, Kenichi; and Matsuo, Syunsuke, 3,934,693.
Matsushita Electric Industrial Co., Ltd.: *See—*
Arimoto, Kazuyuki; Maeda, Toshinobu; Hori, Fuzio; and Takata, Akihiko, 3,935,483.
Kimura, Takeji; Oyama, Tomio; Yamada, Haruyasu; Harada, Shuzi; Yoshino, Hirokazu; and Tsuboka, Eiichi, 3,935,536.
Nishioka, Matsuo; and Oka, Shunzo, 3,935,555.
Tanaka, Masaru; Matsumoto, Yoshimitsu; and Oku, Takeshi, 3,935,530.
Uno, Yoshihiro, 3,935,588.
Matsushita, Katsumi. Carpet cutter. 3,934,342, Cl. 30-293.000.
Matsuura, Eiichi, to Kabushiki Kaisha Daini Seikosha. Second hand regulating mechanism. 3,934,404, Cl. 58-116.00R.
Matsuura, Tetsuro: *See—*
Sugiura, Shotaro; Matsuura, Tetsuro; Ueno, Haruo; Kono, Minoru; Ishikawa, Hideo; and Tokutomi, Thunehiko, 3,935,180.
Matsuzaki, Tetsuo: *See—*
Tamesui, Tuyoshi; and Matsuzaki, Tetsuo, 3,934,376.
Matsuzawa, Toshiaki: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,935,311.
Matthews, Raymond E., to Grove Valve and Regulator Company. Cam locked ball valve. 3,934,606, Cl. 137-454.600.
Mattiussi, Andrea: *See—*
Ciaperoni, Aldemaro; and Mattiussi, Andrea, 3,935,171.
Matuo, Yuhsi: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Matuo, Yuhsi, 3,935,072.
Maurer, Otto F., to United States of America, Air Force. Device to reduce flow induced pressure oscillations in open cavities. 3,934,846, Cl. 244-130.000.
Maurice, David M. Method and apparatus for application of eye drops. 3,934,585, Cl. 128-225.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Liebl, Helmut, 3,935,453.
Maxwell, John, to Wagner Electric Corporation. Chart carrier for recorder. 3,934,835, Cl. 242-67.200.
May & Baker Limited: *See—*
Caton, Michael Peter Lear; Coffee, Edward Charles John; and Watkins, Gordon Leonard, 3,935,261.
May, Louis; and Idzik, Edmund M., to Sate-Life Mfg. Co. Triangular folding reflective traffic marker. 3,934,541, Cl. 116-63.00T.
May, Louis; and Idzik, Edmund M., to Sate-Lite, Mfg. Co. Triangular folding reflective flare having weighted base. 3,934,542, Cl. 116-63.00P.
May, Robert Edward, to Burlington Industries, Inc. Fire-resistant fabrics. 3,934,285, Cl. 5-345.00R.
Mayer, Robert: *See—*
Young, Einar T.; Fromnick, Stephen M.; Mayer, Robert; and Livesay, Robert H., 3,934,756.
Maynard, Robert L., to Servo Corporation of America. Variable color label for object identification system. 3,935,432, Cl. 235-61.12N.
Mayo, Alfred M.: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,934,793.
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,935,426.
Mazzei, Alessandro: *See—*
Lugli, Gabriele; Mazzei, Alessandro; and Brandi, Gabriella, 3,935,175.
McCauley, Claudius R., to Apache Corporation. Pipe ring test machine. 3,934,464, Cl. 73-95.000.
McCaully, Ronald J.: *See—*
Wei, Peter H. L.; and McCaully, Ronald J., 3,935,202.
McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, to American Can Company. Blow molded, oriented plastic bottle and method for making same. 3,934,743, Cl. 215-1.00C.
McClelland, Robert David: *See—*
Baird, David Boyd; Baker, Ronald; Fishwick, Brian Ribbons; and McClelland, Robert David, 3,935,232.
McCloskey, Albert R., to Rockwell International Corporation. Spherical bearing with slotted key. 3,934,954, Cl. 308-72.000.
McClure, William O., to Nelson Research & Development Co. Method for assay of prostaglandins. 3,934,978, Cl. 23-230.00B.
McClure, William O., to Nelson Research & Development Co. Method of assay for prostaglandins of the F alpha series. 3,934,979, Cl. 23-230.00B.
McClure, William O., to Nelson Research & Development Co. Method of assay for prostaglandins of the E series. 3,934,980, Cl. 23-230.00B.
McCrainor, Peter Richard; and Edwards, Bryan William, to Foseco International Limited. Method of marking an ingot. 3,934,639, Cl. 164-100.000.
McCreery, James F., to Kennametal Inc. Grooving and cut off tool. 3,934,320, Cl. 29-96.000.
McCubbin, Melvin J.: *See—*
Cordle, Paul E.; and McCubbin, Melvin J., 3,934,511.
McCulloch Corporation: *See—*
Hirschkoff, Sidney, 3,934,345.
McDonel, James D.: *See—*
Hauser, Ambrose A.; Eckert, Terry T.; and McDonel, James D., 3,934,322.
McDonnell Douglas Corporation: *See—*
Blome, James C.; Goodbrake, Chris J.; O'Brien, Marvin Edward; and Vance, Macy W., 3,935,060.
Sheratte, Martin B., 3,935,116.
McDonough, George W.; Schatz, Douglas S.; and Anderson, Emmett R., to Applied Materials, Inc. Induction heated vapor source. 3,935,412, Cl. 219-10.490.
McEwen, Stephen N., to Henry Manufacturing Co., Inc. Tubular filter in settler. 3,935,105, Cl. 210-138.000.
McFadden, Dale: *See—*
Crepinsek, Alois, 3,934,437.
McGillivray, Daniel A. Vehicle door latch. 3,934,907, Cl. 292-121.000.
McGinnes Manufacturing Company: *See—*
Paxton, Curtis L.; and Gray, Percy J., 3,934,917.
McGourty, Thomas K. Carriage mechanism for printer. 3,934,698, Cl. 197-90.000.
McGregor, Alan P.: *See—*
Walker, Stephen F., 3,934,723.
McHenry, Robert J.: *See—*
McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, 3,934,743.
McKenna, John F., Jr.: *See—*
Dahlen, John M.; Toth, William E.; Shillingford, John T., Jr.; and McKenna, John F., Jr., 3,935,592.
McMaster, Harold A.; and Nitschke, Norman C. Glass tempering system. 3,934,970, Cl. 432-121.000.
McMurray, Russell L. Trench back filling and compacting apparatus. 3,934,363, Cl. 37-82.000.
McNair, Samuel L., to Dazey Products Co. Hair curling instrument. 3,934,597, Cl. 132-37.00R.
McNamee, James Arthur, to RCA Corporation. Connector for a corrugated conduit. 3,934,902, Cl. 285-156.000.
McNeilly, Joseph H.: *See—*
Barsellotti, John A.; McNeilly, Joseph H.; Laliccia, Federico R.; and Pinede, Edouard, 3,935,396.
Mead Johnson & Company: *See—*
Wu, Yao Hua; and Lobeck, Walter G., 3,935,199.
Medalen, Thord Erik. Vehicle for propulsion of gardening implements and the like. 3,934,670, Cl. 180-52.000.
Meier, Harold R., to Judd Ringer Corporation. Composting method and apparatus. 3,934,999, Cl. 71-9.000.
Meier, John G.: *See—*
Baumgartner, Henri; and Meier, John G., 3,934,555.

Mellinger, Frederick N., to Frederick's of Hollywood. Strapless breast support. 3,934,593, Cl. 128-480.000.

Mellinger, Gerald Allen: *See*—
Rodgers, Earl Edward; and Mellinger, Gerald Allen, 3,934,475.

Mennesson, Francois, to Societe Industrielle de Brevets et d'Etudes. Carburettors for internal combustion engines, with an auxiliary starting device. 3,934,571, Cl. 123-179.00G.

Merck & Co., Inc.: *See*—
Hendlin, David; Mata, Justo Martinez; Del Val, Sagrario Mochales; and Stapley, Edward O., 3,935,309.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Lim, Drahoslav, 3,935,342.

Merkle, Hans; and Frotschner, Eberhard, to Daimler-Benz Aktiengesellschaft. Hydrodynamic torque converter for vehicles. 3,934,414, Cl. 60-342.000.

Merrill, Richard E.; and Massucco, Arthur A., to Arthur D. Little, Inc. Method of rendering surfaces nonfogging and resulting articles. 3,935,367, Cl. 428-336.000.

Mertens, Hubert Joseph. Pipe clip. 3,934,318, Cl. 24-249.00R.

Mesek, Frederick K.; Repke, Virginia L.; and Strickel, William R., to Johnson & Johnson. Disposable diaper having facing layer with patterned preferential flow areas. 3,934,588, Cl. 128-290.00W.

Metal Box Limited: *See*—
Flax, Valere, 3,934,780.

Methodist Hospital of Indiana Inc.: *See*—
Whitinger, Robert G., 3,934,474.

Metzinger, Robert E. Hand tool. 3,934,286, Cl. 7-3.00A.

Meurer, Vernon E.: *See*—
Allman, Richard L.; and Meurer, Vernon E., 3,934,789.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Tetrahydroimidazolo[1,2-a]pyridine derivatives. 3,935,220, Cl. 260-294.80C.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-1,4-dihydropyridine derivatives. 3,935,223, Cl. 260-295.50R.

Michelet, Robert Wilson; Ostapiak, Roman; and Scuderi, Rudolph, to Bell Telephone Laboratories, Incorporated. Inrush current limit circuit with reset response to lowered input voltage. 3,935,527, Cl. 321-11.000.

Michels, Paul W.; and Langen, Ben G., to Homburg B.V. Apparatus for the treatment of meat products. 3,934,860, Cl. 259-108.000.

Michon, Gerald J., to General Electric Company. Apparatus for sensing radiation and providing electrical readout. 3,935,446, Cl. 250-211.00J.

Microseal Corporation: *See*—
Anderson, Thomas P., 3,935,430.

Mid-State Chemical & Supply Corporation: *See*—
Thene, Donnie R.; O'Donoghue, Robert J.; and Terry, Donald W., 3,935,124.

Miele & Cie: *See*—
Kaup, Friedel; and Warnke, Heinrich, 3,935,088.

Mihailide, Sergio. Disposable apparatus for brewing a beverage such as coffee. 3,935,318, Cl. 426-80.000.

Mikumo, Masatoshi: *See*—
Kudo, Teizo; Hashizume, Yoshio; Mikumo, Masatoshi; and Itoh, Masanori, 3,935,153.

Miller Chemical Corporation: *See*—
Thene, Donnie R.; O'Donoghue, Robert J.; and Terry, Donald W., 3,935,124.

Miller, Donald E.: *See*—
Gilmore, Cecilia; and Miller, Donald E., 3,935,325.

Miller, Laurence G.; and Smith, Vernon J., to Rank Xerox Ltd. Sheet feeding devices. 3,934,870, Cl. 271-164.000.

Miller, Ronald J.; and Randolph, Thomas M., to United Technologies Corporation. Surge detector for turbine engines. 3,935,558, Cl. 340-27.0SS.

Millheiser, Melvin; and Wurzel, Hugo, to Waldes Kohinoor, Inc. Helical-spring fastened assemblies. 3,934,315, Cl. 24-230.0SL.

Milton Roy Company: *See*—
Jacobsen, John Kenneth, 3,935,463.

Minami, Hiroshi: *See*—
Hashimoto, Sadao; Sakakibara, Ryuji; Kurashige, Yasushi; Takikawa, Katsuo; Osame, Yoko; Minami, Hiroshi; and Suzue, Takashi, 3,935,266.

Minkoff, Walter, to Peerless Paint and Varnish Corporation. Paint composition containing denatonium benzoate and latex resin binder for application over old paint films to prevent ingestion of poisons therefrom. 3,935,137, Cl. 260-17.00R.

Minkov, Viktor Alexeevich: *See*—
Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,934,985.

Minnesota Mining and Manufacturing Company: *See*—
Eian, Gilbert L., 3,935,012.
Taylor, Allen L., 3,935,327.

Minolta Camera Kabushiki Kaisha: *See*—
Kitano, Naohiko; Haseda, Katsumi; and Takahashi, Tamotsu, 3,934,358.

Minow, Irene M. Fanciful object. 3,935,356, Cl. 428-163.000.

Mississippi Chemical Corporation: *See*—
Tucker, Gerald L.; and Blanton, Elmer Ladelle, 3,935,300.

Missol, Detlef: *See*—
Fritz, Heinz Peter; and Missol, Detlef, 3,935,082.

Misumi, Teruyuki; and Tsushima, Sakae, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrodialysis process. 3,935,086, Cl. 204-180.00P.

Mitgau, Rotger; Petrik, Bruno; and Schedlitzki, Dietmar, to Th. Goldschmidt AG. Process for making carrier sheets impregnated with aminoplast comdensation resins. 3,935,336, Cl. 427-173.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Maruyama, Isamu; Suzuki, Shigeyoshi; and Yoshihiro, Yoshitake, 3,935,335.

Miyano, Tetsuji; Suzuki, Kunio; and Fukatsu, Hiroshi, to Banyu Pharmaceutical Co., Ltd. Substituted fusaric acid derivatives. 3,935,221, Cl. 260-295.0AM.

Miyashita, Tsuneo; and Nishio, Hiroaki, to Nippon Kokan Kabushiki Kaisha. Method of blast furnace operation utilizing selective recycling of peripheral gas stream. 3,935,002, Cl. 75-42.000.

Miyoshi, Kunisuke: *See*—
Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Kimura, Hiroyuki, 3,935,038.

Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; and Shoji, Shoji, 3,935,298.

Mizutani, Kiyokazu: *See*—
Ogasawara, Takahisa; Kobayashi, Yorimasa; Mizutani, Kiyokazu; Nakagawa, Teruo; Hisanaga, Noboru; and Tatemichi, Hidemaro, 3,935,173.

Mladek, Walter: *See*—
Hofmann, Karl; and Mladek, Walter, 3,934,903.

Mobil Oil Corporation: *See*—
Dickert, Joseph J., Jr., 3,935,122.
Zelaskowski, Catherine A., 3,934,976.

Moeller, Wolfgang. Unitary clip device for joining removable ceiling tile to hanger member. 3,934,387, Cl. 52-760.000.

Moery, John A.; and Trefz, Harlin J., to International Harvester Company. Debris collector for lawn and garden machines. 3,934,392, Cl. 56-202.000.

Moffatt, John G.: *See*—
Jones, Gordon H.; Moffatt, John G.; and Edge, Michael D., 3,935,184.

Moisar, Erik: *See*—
Klotzer, Sieghart; and Moisar, Erik, 3,935,014.

Moister, Douglas E., Jr., to Burroughs Corporation. High voltage discharge switch for protecting sensitive electronic equipment and the operators thereof. 3,935,508, Cl. 317-2.00R.

Molyneux, George, to Molyneux Rail Clips Limited. Track rail anchorages. 3,934,800, Cl. 238-341.000.

Molyneux Rail Clips Limited: *See*—
Molyneux, George, 3,934,800.

Momono, Masakichi: *See*—
Fujieda, Mamoru; Yamauchi, Teruo; and Momono, Masakichi, 3,934,567.

Monadnock Lifetime Products, Inc.: *See*—
White, Davis L., 3,934,877.

Monsanto Company: *See*—
Ruest, Dennis A.; Shen, C. Y.; and Mason, John L., 3,935,257.

Montedison S.p.A.: *See*—
Ciaperoni, Aldemaro; and Mattiussi, Andrea, 3,935,171.

Mood, Robert D.; Hunter, Joseph P.; and Burgen, Dering R., to United States of America, Navy. Catapult breakaway load simulator circuit. 3,935,440, Cl. 235-184.000.

Moon, Malcolm W., to Upjohn Company, The. Method of use and formulations. 3,935,316, Cl. 424-327.000.

Mooney Engineering, Inc.: *See*—
Mooney, John Russell; and Radford, Troy Richard, 3,934,701.

Mooney, John Russell; and Radford, Troy Richard, to Mooney Engineering, Inc. Linear indexing machine. 3,934,701, Cl. 198-19.000.

Moore, Donald G., to Chemetron Corporation. Electromagnetic oven which supplies different amounts of heat to items positioned in different regions of a single heating chamber. 3,935,415, Cl. 219-10.55F.

Moore, Harry W., III, to Sperry Rand Corporation. Signal generator comprising an addressable memory. 3,935,565, Cl. 340-173.00R.

Moos, Jakob, to General Motors Corporation. Energy absorbing steering column for vehicles, particularly motor vehicles. 3,934,897, Cl. 280-87.00R.

Morain, Eldon W.; and Cole, Judson C., to Continental Industries, Inc. Seating and actuator for a ball valve. 3,934,849, Cl. 251-163.000.

Moran, Paul R.; Podgorsak, Ervin; Fullerton, Gary D.; and Fuller, Gene E., to Wisconsin Alumni Research Foundation. Dielectric material for dosimeters. 3,935,457, Cl. 250-336.000.

Morfeldt, Carl-Olof Oskar: *See*—
Janelid, Erik Ingvar; and Morfeldt, Carl-Olof Oskar, 3,934,420.

Morgan Construction Company: *See*—
Brodeur, Robert R., 3,934,447.
Jennings, Lewis C., 3,934,678.

Mori, Yoshifumi: *See*—
Sugano, Takuo; and Mori, Yoshifumi, 3,935,328.

Moriondo, Mario: *See*—
Di Salvo, Salvatore; and Moriondo, Mario, 3,934,301.

Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, to Sankyo Company Limited. Substitute pyridinol-containing compositions and methods for the treatment of coccidiosis. 3,935,311, Cl. 424-200.000.

Morita, Ken-ichi; Kinoshita, Yoshiro; and Kashio, Shigetora, to Toray Industries, Inc. Process for producing carbon fibers from organic fibrous material. 3,935,301, Cl. 423-447.000.

Morita, Tomijiro; and Funahashi, Isao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for removing sulfur dioxide from a combustion exhaust gas. 3,935,296, Cl. 423-242.000.

Moriyama, Hiroatsu: *See*—
Kanai, Tamaki; Yamagishi, Takashi; Ohta, Tetsuya; and Moriyama, Hiroatsu, 3,935,166.

Morlet, Jean Georges Marie, to Creusot-Loire. Process and installation for reductive melting of iron scrap, powder or sponge. 3,934,864, Cl. 266-36.00H.

Morozumi, Shinji; and Kodaira, Mitsuharu, to Kabushiki Kaisha Seikosha. Complementary MOS transistor crystal oscillator circuit. 3,935,546, Cl. 331-116.00R.

Morozumi, Shinji: *See*—
Nishimura, Izuhiko; and Morozumi, Shinji, 3,934,400.

Morris, Herman H., to Custom Mechanical Contractors, Inc. Flooded refrigerant condenser head pressure control. 3,934,425, Cl. 62-117.000.

Morrison Machine Co.: *See*—
Marino, Thomas J., 3,934,502.

Morse, Robert S., to Burroughs Corporation. Electronic package assembly with capillary bridging connection. 3,934,336, Cl. 29-627.000.

Mortensen, La Vaughn L. Prosthetic limb with weight-responsive joint lock. 3,934,273, Cl. 3-27.000.

Mostardo, August F., Jr.: *See*—
Carlson, Elmer V.; Mostardo, August F., Jr.; and Diblick, Alex V., 3,935,398.

Mostek Corporation: *See*—
Paluck, Robert John, 3,935,476.

Motion Systems, Inc.: *See*—
Burr, John Kelsey; and Wolf, William, 3,934,946.

Motley, David M.; and Cheng, King Y., to Hycom Incorporated. Fast equalization acquisition for automatic adaptive digital modem. 3,935,535, Cl. 325-324.000.

Motycka, Charles J.: *See*—
Doerfling, Ralph G.; and Motycka, Charles J., 3,935,353.

Mowry, William H., Jr.: *See*—
Bagen, Herbert John; Ferguson, Ronald Worden; Korytkowski, Henry M.; and Mowry, William H., Jr., 3,934,501.

Muchowski, Joseph M.; and Guzman, Angel, to Syntex (U.S.A.) Inc. 11α-methylsubstituted prostaglandin derivatives. 3,935,241, Cl. 260-468.00D.

Muddiman, George Robert; and Edge, Fred, to Process Equipment Limited. Rupture disc structure. 3,934,602, Cl. 137-68.000.

Mueller, Hans W.; and Shattuck, Richard E., to SCM Corporation. Keyboard touch control. 3,934,696, Cl. 197-17.000.

Mueller, Paul; Cannon, Robert B.; and Prine, Ray A., to Paul Mueller Company. Bulk cooler and storage tank. 3,934,821, Cl. 239-224.000.

Muhlenkamp, John H.: *See*—
Dunlap, Danny L.; Huelsman, Charles E.; and Muhlenkamp, John H., 3,934,836.

Muhlstadt, William J.; and Schornhorst, James R., to PPG Industries, Inc. Control of thermal convection in a float glass forming chamber. 3,934,994, Cl. 65-65.00A.

Mukunashi, Hiroaki: *See*—
Ichiba, Terumichi; Shimba, Hiroshi; and Mukunashi, Hiroaki, 3,935,375.
Yoshikawa, Kanji; Tatsukami, Yoshiharu; Shimba, Hiroshi; and Mukunashi, Hiroaki, 3,935,374.

Mulderrig, Ciaran Joseph, to BOC Limited. Triggering devices. 3,934,292, Cl. 9-318.000.

Mullaly, Jerome R.: *See*—
Fox, Richard W., Jr.; and Mullaly, Jerome R., 3,935,482.

Mullen, Edward J.: *See*—
Donnelly, Thomas L.; and Mullen, Edward J., 3,935,424.

Muller, Eberhard; and Marwede, Gunter, to Bayer Aktiengesellschaft. Polymerisation and copolymerisation of dienes. 3,935,177, Cl. 260-84.700.

Muller, Otto; Rottger, Hans; Kastl, Hans; and Hagen, Hans-Gunter, to Siemens Aktiengesellschaft. Apparatus for inspecting and repairing a pressurized-water reactor's steam generator heat exchanger tubes. 3,934,731, Cl. 214-1.0BB.

Muller, Richard: *See*—
Wingler, Frank; Pedain, Josef; Muller, Richard; Dhein, Rolf; and de Cleur, Eckhard, 3,935,138.

Muller, Rudolf; and Decker, Jurgen, to Volkswagenwerk Aktiengesellschaft. Speed-dependent ignition angle control. 3,934,563, Cl. 123-117.00R.

Muneoka, Harunobu; and Nezu, Tuguo, to Kansai Paint Company, Ltd. Method for forming a transparent image on a sheet. 3,935,333, Cl. 427-49.000.

Munk, Miner N., to Varian Associates. Solvent gradient generator for chromatography systems. 3,934,456, Cl. 73-61.10C.

Murakami, Masuo; Takahashi, Kozo; Isaka, Ichiro; Ozasa, Teruaki; and Kashiwagi, Teruya, to Yamanouchi Pharmaceutical Co., Ltd. Process for the preparation of the cephalosporanic acid derivative. 3,935,198, Cl. 260-243.00C.

Murano, Minoru; Yanabu, Satoru; and Sodeyama, Hitoshi, to Tokyo Shibaura Electric Co., Ltd. Vacuum interrupter. 3,935,406, Cl. 200-144.00B.

Murata Kikai Kabushiki Kaisha: *See*—
Shindo, Noboru; and Hashizume, Hiroshi, 3,934,398.

Murayama, Minoru: *See*—
Sasaki, Kyozo; and Murayama, Minoru, 3,934,346.

Murphy, William C., to Shock V Automatic Lubrication Systems, Inc. Lubricant system. 3,934,600, Cl. 137-2.000.

Muzyka, Donald R.; and Gebeau, Ronald C., to Carpenter Technology Corporation. Austenitic iron-nickel base alloy. 3,935,037, Cl. 148-38.000.

Nabisco, Inc.: *See*—
Sakler, Stephen Allen; Porcello, Samuel Joseph; and Rossen, Jack L., 3,935,321.

Nadella: *See*—
Pitner, Alfred, 3,934,956.

Naegeli, Peter, to Givaudan Corporation. Novel odorant. 3,935,253, Cl. 260-345.200.

Nagaishi, Hatuo: *See*—
Masaki, Kenji; and Nagaishi, Hatuo, 3,934,412.

Nagashima, Mitsuyoshi, to Citizen Watch Co., Ltd. Finely adjustable table assembly. 3,935,486, Cl. 310-12.000.

Nagele, Erwin: *See*—
Romann, Peter; and Nagele, Erwin, 3,934,561.

Naik, Kamal: *See*—
Novak, Frank A.; Schweitzer, Earl O.; and Naik, Kamal, 3,934,692.

Naito, Hiroyuki: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; and Shoji, Shoji, 3,935,298.

Najer, Henry: *See*—
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Manoury, Philippe Michel Jacques; and Dumas, Andre Pierre Fernand, 3,935,229.

Nakada, Masahiko: *See*—
Matsumoto, Hirohumi; and Nakada, Masahiko, 3,934,565.

Nakagawa, Teruo: *See*—
Ogasawara, Takahisa; Kobayashi, Yorimasa; Mizutani, Kiyokazu; Nakagawa, Teruo; Hisanaga, Noboru; and Tatemichi, Hidemaro, 3,935,173.

Nakamura, Yoshito: *See*—
Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Shigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, 3,934,969.

Nakanishi, Michio; and Yuki, Hiroshi, to Yoshitomi Pharmaceutical Industries, Ltd. Substituted pyrrolidinemethanols. 3,935,217, Cl. 260-326.50R.

Nakanishi, Tadao: *See*—
Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Shigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, 3,934,969.

Nakao, Schoichi: *See*—
Saito, Chuichi; and Nakao, Schoichi, 3,934,699.

Nakata, Kensuke: *See*—
Tomozawa, Akihiro; Nakata, Kensuke; Kikuchi, Akira; and Agastuma, Takashi, 3,935,083.

Nalco Chemical Company: *See*—
Robertson, Reed S.; and Watson, William R., 3,934,646.

Narayanan, Venkatachala Lakshmi: *See*—
Hauck, Frederic Peter; Cimarusti, Christopher M.; and Narayanan, Venkatachala Lakshmi, 3,935,267.

Narui, Hiroshi; and Shinohara, Terumi, to Oike & Company, Ltd. Process for preparing a metallized resin film for condenser element. 3,935,334, Cl. 427-81.000.

Nash, James L.; and Carrico, Phillip H., to General Electric Company. Hysteresis clutch for film winding. 3,934,833, Cl. 242-56.900.

National Patent Development Corporation: *See*—
Weiss, Jonas, 3,935,368.

National Research Development Corporation: *See*—
Bardsley, William; Green, Geoffrey William; Holliday, Charles Harry; and Hurle, Donald Thomas James, 3,934,983.

National Steel Corporation: *See*—
Saunders, William T., 3,934,527.

NCR Corporation: *See*—
Janning, John L., 3,934,690.

Nederlof, Anton Marie, to U.S. Philips Corporation. Rolling diaphragm seal between two relatively moving parts. 3,934,480, Cl. 74-18.200.

Needt, Jan Henrik, to Wiva N.V. Container, particularly for liquids. 3,934,747, Cl. 220-5.00R.

Neiland, Oyar Yanovich; and Kreitsberga, Yana Nikolaevna. Process for producing aromatic α-diketones. 3,935,239, Cl. 260-469.000.

Neithercutt, Marvin C. Explosive torch tip cleaner tool. 3,934,303, Cl. 15-406.000.

Nelken, Ewald, to Fried. Krupp Huttenwerke AG. Buffer for spring-supported wheels. 3,934,921, Cl. 295-1.000.

Nelson, Daniel E. Flexpower deep well drill. 3,934,660, Cl. 175-102.000.

Nelson, Mark A., to Texas Instruments Incorporated. Multilayer printed circuit board. 3,934,335, Cl. 29-625.000.

Nelson, Norman A. Modular underwater well platform system. 3,934,658, Cl. 175-7.000.

Nelson Research & Development Co.: *See*—
McClure, William O., 3,934,978.
McClure, William O., 3,934,979.
McClure, William O., 3,934,980.

Nelson, William F.: *See*—
Barber, Stephen W.; and Nelson, William F., 3,935,119.

Neptune International Corporation: *See*—
Cielaszyk, Edward F.; DeRose, Ralph A.; and Kravcik, John W., 3,935,433.

Neri, Joseph R. Hamburger patty press. 3,934,308, Cl. 17-32.000.

Neti, Radhakrishna M.: *See*—
Frain, John P.; Harman, John N., III; and Neti, Radhakrishna M., 3,934,991.

Neumann, Friedhelm; and Zeller, Josef K., to Concast AG. Submerged nozzle for continuous casting. 3,934,640, Cl. 164-281.000.

New England Institute, Inc.: *See*—
Adler, Alan D., 3,935,031.

New England Union Co.: *See*—
Pett, Alfred W., 3,934,812.

Newey Goodman Limited: *See*—
Whysall, William Arthur, 3,934,314.

Newitt, John H. Storage of a representation of an image. 3,935,383, Cl. 178-7.200.

Newnam, Brian E.: *See*—
Campillo, Anthony J.; Newnam, Brian E.; Shapiro, Stanley L.; and Terrell, N. James, Jr., 3,935,545.

Newton, David Francis: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, 3,934,972.

Nezu, Tuguo: *See*—
Muneoka, Harunobu; and Nezu, Tuguo, 3,935,333.

Nichols, Dewey F. Ground position indicator system. 3,935,557, Cl. 340-25.000.

Nickerson, Richard Gorham; Bouchard, Robert Thomas; Hurtubise, Paul Joseph Charles; and Duchesneau, Eugene Alfred, Jr., to Borden, Inc. Blended latex binder for exterior paints with wet primed adhesion. 3,935,151, Cl. 260-29.6WB.

Nicol, Edward A.: *See*—
Triplett: Gerald H.; Nicol, Edward A.; and Klehm, William G., Jr., 3,935,372.

Nicolas, Yves, to Schlumberger Technology Corporation. Spinner flowmeter with isolated bearings. 3,934,467, Cl. 73-155.000.

Nielsen, Leif: *See*—
Jespersen, Hans Jorgen; and Nielsen, Leif, 3,934,426.

Nierode, Dale E.; Kehn, Donald M.; and Kruk, Keith F., to Exxon Production Research Company. Method of acidizing subterranean formations. 3,934,651, Cl. 166-282.000.

Nieuweboer, Bob: *See*—
Engelfried, Otto; Nieuweboer, Bob; Petzoldt, Karl; Kerb, Ulrich; and Lubke, Klaus, 3,935,245.

Nikitin, Jury Stepanovich: *See*—
Kiselev, Andrei Vladimirovich; Kustova, Galina Lvovna; Lipkind, Boris Alexandrovich; and Nikitin, Jury Stepanovich, 3,935,299.

Nippon Electric Company Limited: *See*—
Katagiri, Takeo; and Fujiwara, Shinichi, 3,934,717.

Nippon Kokan Kabushiki Kaisha: *See*—
Arimura, Tohru; Okado, Masaru; Ichimaru, Takarokuro; and Kamata, Masamoto, 3,934,438.
Miyashita, Tsuneo; and Nishio, Hiroaki, 3,935,002.

Nippon Oil Company Ltd.: *See*—
Shinomura, Toshihiko, 3,935,047.

Nippon Piston Ring Co., Ltd.: *See*—
Okada, Syoji, 3,934,886.

Nippon Soda Co., Ltd.: *See*—
Oda, Nakaaki; Horie, Yoshio; Idohara, Mitsuru; and Iwasa, Shozo, 3,935,098.

Nippon Steel Corporation: *See*—
Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Kimura, Hiroyuki, 3,935,038.
Tanaka, Tadashi; Oka, Joji; and Saito, Katushi, 3,935,035.

Nippon Zeon Co. Ltd.: *See*—
Go, Tadahiro; Suzuki, Takashi; and Inoue Masaaki, 3,935,140.
Watanabe, Koichi, 3,935,158.

Nischk, Gunther: *See*—
Velker, Eugen; Bentz, Francis; and Nischk, Gunther, 3,935,174.

Nishida, Keijiro: *See*—
Itoh, Susumu; Nishida, Keijiro; Kamiya, Osamu; and Sekimura, Nobuyuki, 3,934,961.

Nishiie, Kazuyoshi: *See*—
Abe, Jinnosuke; Watanabe, Tetsuo; Take, Teruo; Fujimoto, Kentaro; Fujii, Tadashiro; and Nishiie, Kazuyoshi, 3,935,193.

Nishimura, Izuhiko; and Sano, Tadashi, to Kabushiki Kaisha Seikosha. Electric timepiece incorporating rectifier and driving circuits integrated in a single chip. 3,934,399, Cl. 58-23.00R.

Nishimura, Izuhiko; and Morozumi, Shinji, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 3,934,400, Cl. 58-23.00R.

Nishimura, Tokio; Yamada, Minoru; Amano, Hiroyuki; and Oishi, Yasushi, to Fuji Photo Film Company, Ltd. Silver halide color photographic materials containing 3-anilino-5-pyrazolone couplers. 3,935,016, Cl. 96-74.000.

Nishio, Hiroaki: *See*—
Miyashita, Tsuneo; and Nishio, Hiroaki, 3,935,002.

Nishioka, Matsuo; and Oka, Shunzo, to Matsushita Electric Industrial Co., Ltd. Assembly for fine adjustment of a variable impedance mechanism. 3,935,555, Cl. 338-174.000.

Nissan Motor Company Limited: *See*—
Masaki, Kenji; and Konno, Mitinobu, 3,934,411.
Masaki, Kenji; and Nagaishi, Hatuo, 3,934,412.
Ogihara, Yoshiyuki; and Aya, Norimoto, 3,934,912.
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 3,934,429.
Togawa, Kinmochi; Matoba, Kazuo; Takao, Hiroshi; and Hata, Yoshitaka, 3,935,089.

Nitschke, Norman C.: *See*—
McMaster, Harold A.; and Nitschke, Norman C., 3,934,970.

Nittan Company, Ltd.: *See*—
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NL Industries, Inc.: *See*—
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Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Shigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, to Kawasaki Jukogyo Kabushiki Kaisha. Method for burning emulsion oils. 3,934,969, Cl. 431-9.000.

Noll, Klaus; Schroer, Walter; Pedain, Josef; and Reiff, Helmut, to Bayer Aktiengesellschaft. Polyurethaneamides dispersible in water and dispersions containing them. 3,935,146, Cl. 260-29.2TN.

Noothout, Arend Jaman: *See*—
Kanij, Johannes Bastiaan Willem; and Noothout, Arend Jaman, 3,935,120.

Norberg, Lars-Gunnar, to Uddeholms Aktiebolag. Apparatus for refining molten metal and molten metal refining process. 3,934,863, Cl. 266-35.000.

Nordischer Maschinenbau Rud. Baader: *See*—
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Northrop Corporation: *See*—
Eguchi, Ronald G.; Mann, Michael M.; Lacina, William B.; and Crill, Kay C., 3,935,543.
Rosin, Alexander, 3,934,845.

Norton, Richard V., to Sun Research and Development Co. Preparation of phthalate esters. 3,935,238, Cl. 260-475.00R.

Noshi, Yoshibumi: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; and Shoji, Shoji, 3,935,298.

Novak, Frank A.; Schweitzer, Earl O.; and Naik, Kamal, to Ardac, Inc. Positive action coin dispenser. 3,934,692, Cl. 194-4.00C.

Nuclear Engineering Co., Inc.: *See*—
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Nupla Corporation: *See*—
Carmien, Joseph Allen, 3,935,055.

Nuttall, Harold W., to United States Gypsum Company. Molten salt method of producing fire resistant wood articles. 3,935,343, Cl. 427-353.000.

N.V. Optische Industrie "de Oude Delft": *See*—
Vlasbloem, Hugo, 3,935,461.

Nystrom, Charles W., to R. J. Reynolds Tobacco Company. Continuous isomerization process utilizing immobilized flocculate enzyme. 3,935,068, Cl. 195-31.00F.

Obara, Hiroshi: *See*—
Yoshida, Masafumi; Segawa, Masahiro; and Obara, Hiroshi, 3,935,485.

O'Brien, John F., to Xerox Corporation. Constant current charging device. 3,935,517, Cl. 317-262.00A.

O'Brien, Marvin Edward: *See*—
Blome, James C.; Goodbrake, Chris J.; O'Brien, Marvin Edward; and Vance, Macy W., 3,935,060.

Oce-van der Grinten N.V.: *See*—
Crommentuyn, Gerardus J.; and Kuiper, Johannes H. A., 3,935,009.

Ochsner, Paul Albert, to Givaudan Corporation. Dimorpholinomethyl-(4-methyl-3-pentenyl)-cyclohexenenes. 3,935,205, Cl. 260-246.00B.

Oda, Nakaaki; Horie, Yoshio; Idohara, Mitsuru; and Iwasa, Shozo, to Nippon Soda Co., Ltd. Adsorbent process for heavy metals. 3,935,098, Cl. 210-38.000.

Odom, J. T.: *See*—
Zumsteg, D. Bruce; Origlia, Gino; and Odom, J. T., 3,934,739.

O'Donoghue, Robert J.: *See*—
Thene, Donnie R.; O'Donoghue, Robert J.; and Terry, Donald W., 3,935,124.

Oehlerking, Conrad, to Volkswagenwerk Aktiengesellschaft. Vehicle bumper arrangement. 3,934,911, Cl. 293-68.000.

Oeschger, Frank A., Jr., to Pitney-Bowes, Inc. Collating, folding an inserting system. 3,934,867, Cl. 270-32.000.

Oess, Frederick G., to Texas Instruments Incorporated. Monolythic staggered mesh deflection systems for use in flat matrix CRT's. 3,935,499, Cl. 313-413.000.

Oess, Frederick G.; and Peshock, Michael, Jr., to Texas Instruments Incorporated. Flat CRT system. 3,935,500, Cl. 313-495.000.

Ofstead, Eilert A., to Goodyear Tire & Rubber Company, The. Cycloolefin metathesis. 3,935,179, Cl. 260-93.100.

Ogasawara, Takahisa; Kobayashi, Yorimasa; Mizutani, Kiyokazu; Nakagawa, Teruo; Hisanaga, Noboru; and Tatemichi, Hidemaro, to Toagosei Chemical Industrial Co. Ltd. Curable compositions. 3,935,173, Cl. 260-78.50E.

Ogawa, Masahiro: *See*—
Koyama, Masao; Okada, Noboru; and Ogawa, Masahiro, 3,935,056.

Ogihara, Yoshiyuki; and Aya, Norimoto, to Nissan Motor Company Limited. Vehicle energy-absorbing system with adjustable absorption capacity. 3,934,912, Cl. 293-73.000.

Ohi, Akira: *See*—
Hozumi, Yukio; Ohi, Akira; and Imai, Tatuhiko, 3,935,152.

Ohl, Wolf: *See*—
Ball, Herbert; and Ohl, Wolf, 3,935,395.

Ohm Acoustics Corporation: *See*—
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Ohmae, Tadayuki: *See*—
Kudo, Ken-ichi; Ohmae, Tadayuki; and Uno, Akihiko, 3,935,282.

Ohta, Takahiro, to Fuji Photo Film Co., Ltd. Color television signal generator. 3,935,589, Cl. 358-54.000.

Ohta, Tetsuya: *See—*
Kanai, Tamaki; Yamagishi, Takáshi; Ohta, Tetsuya; and Moriyama, Hiroatsu, 3,935,166.
Oike & Company, Ltd.: *See—*
Narui, Hiroshi; and Shinohara, Terumi, 3,935,334.
Oishi, Yasushi: *See—*
Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, 3,935,015.
Nishimura, Tokio; Yamada, Minoru; Amano, Hiroyuki; and Oishi, Yasushi, 3,935,016.
Oka, Joji: *See—*
Tanaka, Tadashi; Oka, Joji; and Saito, Katushi, 3,935,035.
Oka, Shunzo: *See—*
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Okada, Noboru: *See—*
Koyama, Masao; Okada, Noboru; and Ogawa, Masahiro, 3,935,056.
Okada, Syoji, to Nippon Piston Ring Co., Ltd. Corrugated radial spacer expander for compound oil scraping rings. 3,934,886, Cl. 277-2.000.
Okada, Takashi; and Utsunomiya, Kimitake, to Sony Corporation. Non-linear amplifier. 3,935,478, Cl. 307-229.000.
Okado, Masaru: *See—*
Arimura, Tohru; Okado, Masaru; Ichimaru, Takarokuro; and Kamata, Masamoto, 3,934,438.
Oku, Takeshi: *See—*
Tanaka, Masaru; Matsumoto, Yoshimitsu; and Oku, Takeshi, 3,935,530.
Okubo, Hiroshi; Kato, Masamichi; Kaetsu, Isao; and Ito, Akihiko, to Japan Atomic Energy Research Institute. Cast polymerization process with improved mold release. 3,935,292, Cl. 264-338.000.
Okumura, Akio: *See—*
Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, 3,935,015.
Olcott, Eugene L. Shaped articles of pyrolytic graphite-silicon carbide microcomposites. 3,935,354, Cl. 428-107.000.
Olin Corporation: *See—*
Bhutani, Sudhir K., 3,935,264.
Marlow, Darrell W.; and Freeman, Brady L., 3,934,984.
van Leuwen, Bruce G.; and Colafati, Ralph A., III, 3,935,133.
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O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and by Childs, Patricia M., executrix, to Accuvote, International, Inc. Voting machine. 3,934,793, Cl. 235-51.000.
O'Neal, Cothburn M., to Riverside Press, Inc., The. Voting machine with band interlock. 3,934,794, Cl. 235-54.00A.
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased (by Childs, Patricia M., executrix), to Riverside Press, Inc., The. Voting machine. 3,935,426, Cl. 235-54.00C.
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O'Neill, Wilbur J., to Westinghouse Electric Corporation. Breathing apparatus. 3,934,581, Cl. 128-142.000.
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Orsburn, William. Tire retrieval tool. 3,934,853, Cl. 254-131.000.
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Osmond, Desmond Wilfrid John; and Thompson, Morice William, to Imperial Chemical Industries Limited. Polymer manufacture. 3,935,155, Cl. 260-34.200.
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Ostop, John A.; Kisinko, Paul M.; and Henry, Joseph F., to Westinghouse Electric Corporation. High power, high frequency bipolar transistor with alloyed gold electrodes. 3,935,587, Cl. 357-34.000.
Ostrowsky, Efrem: *See—*
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Oude Alink, Bernardus A., to Petrolite Corporation. Process of reverting thiophosphates. 3,935,215, Cl. 260-327.00C.
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Owens-Corning Fiberglas Corporation: *See—*
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Pershing, John A., 3,934,730.
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Keller, William B., 3,934,775.
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Taylor, Lynn J., 3,935,337.
Oxe, Josef; and Keller, Rudolf, to Ciba-Geigy Corporation. Aqueous polystyrene containing dispersions as anti-statics for the permanent finishing of fibre materials. 3,935,150, Cl. 260-29.6MN.
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Palazzetti, Mario; and Grisotto, Franco, to Fiat Societa per Azioni. Method of connecting a terminal to a wire. 3,934,337, Cl. 29-628.000.
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Pasini, Joseph, III; and Overbey, William K., Jr., to United States of America, Energy Research and Development Administration. Method for removal of methane from coalbeds. 3,934,649, Cl. 166-254.000.

Pastor, Ricardo C.; Arita, Kaneto; and Robinson, Morton, to Hughes Aircraft Company. Preparation of alkaline earth metal halide crystals for laser windows. 3,935,302, Cl. 423-490.000.

Patou, Claude: *See—*
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Paul, George A., to Dow Chemical Company, The. Coolant for rotary engine. 3,935,115, Cl. 252-73.000.

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Paulus, Peter V.; and Ungerer, Aaron J., to Standard Products Co., The. Edge trim. 3,934,385, Cl. 52-717.000.

Paxton, Curtis L.; and Gray, Percy J., to McGinnes Manufacturing Company. Clamshell bucket apparatus. 3,934,917, Cl. 294-70.000.

Pearson, John B., III: *See—*
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Pearson, Melvin B.: *See—*
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Pedersen, Harry. Coin-controlled fluid dispenser. 3,934,694, Cl. 194-82.000.

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Penicaud, Etienne; and Lienard, Maurice, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for developing a neutralization signal for an echo suppressor. 3,935,403, Cl. 179-170.200.

Penkov, Walter V.: *See—*
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Pennwalt Corporation: *See—*
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Pentheroudakis, Panajiotis S., to United States of America, Navy. Signal source position-determining process. 3,935,574, Cl. 343-113.00R.

Perl, Richard L., to Tappan Company, The. Adjustable thermal valve. 3,934,811, Cl. 251-11.000.

Perlmutter, Neal Robert. Individual room temperature control system. 3,934,797, Cl. 236-46.000.

Perry, Loren L.; and Tuglus, Louis J. Roof vent. 3,934,383, Cl. 52-200.000.

Perry, Russell C.; and Porter, Roy W., to Diagnostic Research, Inc. Automatic bacterial specimen streaker and method for using same. 3,935,075, Cl. 195-127.000.

Pershing, John A., to Owens-Corning Fiberglas Corporation. Apparatus for transporting articles along curved horizontal path while maintaining orientation constant. 3,934,730, Cl. 214-1.0BH.

Persmark, Ulf; and Stenback, Jan-Erik, to AB Karlshamns Oljefabriker. Cream base for confectionary use. 3,935,324, Cl. 426-572.000.

Persson, Bo Klas Gerhard, to Trelleborgs Gummifabriks Aktiebolag. Wear-resistant wall linings for shells of mills and like apparatuses. 3,934,828, Cl. 241-102.000.

Persson, Holger. Timer switch assembly. 3,935,404, Cl. 200-35.00R.

Peshock, Michael, Jr.: *See—*
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Peters, Dan William, to Sierracin Corporation, The. Method for monitoring the surface resistivity of metallized film. 3,935,458, Cl. 250-338.000.

Petit, Didier Marceau. Core structure, assembly and process. 3,934,519, Cl. 108-150.000.

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Petrik, Bruno: *See—*
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Petrikat, Klaus Rudiger, to International Standard Electric Corporation. Capacitor with glass metal conductive layer. 3,935,516, Cl. 317-230.000.

Petrocelli, Edward A.; and Louie, Anthony C. H., to United States of America, Navy. Electronic solid state sensor image size control. 3,935,381, Cl. 178-7.100.

Petrolite Corporation: *See—*
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Petrusenko, Dmitry Pavlovich; Andreev, Lev Grigorievich; and Epshtein, Alexandr Mikhailovich. Covering of an aluminum-producing electrolysis cell. 3,935,090, Cl. 204-243.00R.

Pett, Alfred W., to New England Union Co. Valve construction and flow restrictor for use therewith. 3,934,812, Cl. 251-45.000.

Petzoldt, Karl: *See—*
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Pfarrer, David M.; and Parker, Sidney A., to Lennox Industries Inc. Control apparatus for two-speed compressor. 3,935,519, Cl. 318-305.000.

Pfizer Inc.: *See—*
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Hess, Hans-Jurgen E., 3,935,213.

Phaup, Charles W., to Telsco Industries. Sprinkler control. 3,934,820, Cl. 239-205.000.

Philadelphia Quartz Company: *See—*
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Philip A. Hunt Chemical Corporation: *See—*
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Philip Morris Incorporated: *See—*
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Philipp, Otto Max. Exchangeable frame for transparencies. 3,934,367, Cl. 40-152.000.

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Phillips, Duncan Adrian Sidney: *See—*
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Phillips, Prella M.; Dick, Clarence R.; and Baggett, Joseph M., to Dow Chemical Company, The. Copolymers of N-substituted aziridines and epoxides episulfides. 3,935,269, Cl. 260-584.00B.

Photocircuits Corporation: *See—*
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Piatti, Omar; and Berliner, Wally, to Waldes Kohinoor, Inc. Special-purpose spring retaining rings. 3,934,866, Cl. 267-161.000.

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Piazza, Judith B., executrix: *See—*
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Pisoni, Ottorino. Device for a controlled, centrifugal distribution of products to post-finishing machines. 3,934,704, Cl. 198-25.000.

Pissiotas, Georg, to Ciba-Geigy Corporation. N-lower alkyl, N-lower alkyliminomethyl carbamic acid esters of α-naphthol and substituted phenols. 3,935,250, Cl. 260-346.20R.

Pitner, Alfred, to Nadella. Axial thrust bearing. 3,934,956, Cl. 308-174.000.

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Pohjola, Jorma Toivo Tapani. Steering mechanism for track vehicles. 3,934,664, Cl. 180-9.440.

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Poliniak, Eugene Samuel; Scheible, Howard George; and Himics, Richard Joseph, to RCA Corporation. Preparation of olefin SO_2 copolymer electron beam resist films and use of same for recording. 3,935,331, Cl. 427-43.000.
Poliniak, Eugene Samuel; and Himics, Richard Joseph, to RCA Corporation. Development of poly(1-methyl-1-cyclopentene-SO_2) electron beam resist. 3,935,332, Cl. 427-43.000.
Pollack, Roy: *See—*
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Polychrome Corporation: *See—*
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Posso, Patrick. Minicassette for recording tape. 3,934,842, Cl. 242-199.000.
Potier, Pierre Roger, to Foseco International Limited. Casting of molten metals. 3,934,637, Cl. 164-56.000.
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Potts, James Edward; Cornell, Stephen Watson; and Sracic, Albert Martin, to Union Carbide Corporation. Environmentally degradable ethylene polymeric compositions. 3,935,141, Cl. 260-23.00H.
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Frank, Robert G., 3,934,996.
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Jerabek, Robert D.; and Marchetti, Joseph R., 3,935,087.
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Preisler, James Michael, to Drag Specialties, Inc. Socket mounting structure for vehicle lights. 3,935,445, Cl. 240-7.10R.
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Primark Corporation: *See—*
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Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Polysiloxane-polyoxyalkylene compositions used in polyurethane foam. 3,935,123, Cl. 252-351.000.
Proksch, Emil; and Eschweiler, Helmut, to Eternit-Werke Ludwig Hatschek & UCB,S.A. Porous, heat-sensitive substrates coated with synthetic resins. 3,935,364, Cl. 428-304.000.
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Pruchno, Albert A.: *See—*
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Pruvot, Francois Claude, to Regie Nationale des Usines Renault. Self-pressurizing and self-compensating hydrostatic bearing. 3,934,948, Cl. 308-9.000.
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Psensky, Miroslav: *See—*
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Pucci, Massimo. Hairdressing device. 3,935,423, Cl. 219-225.000.
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Puskas, Imre; and Cengel, John A., to Standard Oil Company. Tar reduction by inorganic halide for reaction of unsaturated anhydride and polybutene. 3,935,249, Cl. 260-346.80R.
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Quate, Calvin F.; and Grudkowski, Thomas W., to Leland Stanford, Jr. University, The Board of Trustees of. Charge storage and monitoring apparatus utilizing acoustic waves. 3,935,564, Cl. 340-173.00R.
Quay, Robert: *See—*
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Quebec Iron and Titanium Corporation - Fer et Titane du Quebec, Incorporated: *See—*
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Quillevere, Herve Alain; and Caruel, Jacques Emile Jules, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Gas turbine combustion chambers. 3,934,409, Cl. 60-39.650.
Quirouette, Richard L.; and Lemay, Rejean P. Portable swimming pool construction. 3,934,277, Cl. 4-172.190.
R. J. Reynolds Tobacco Company: *See—*
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Nystrom, Charles W., 3,935,068.
Raabe, Gotthold: *See—*
Zechnall, Richard; Linder, Ernst; Schmid, Albert; Raabe, Gotthold; Kerner, Karl; and Socknick, Rudi, 3,935,444.
Rabenschlag, Frank: *See—*
Kirschstein, Horst; Rabenschlag, Frank; Lotz, Dieter; Holland-Cunz, Gerhard; and Blomberg, Hans, 3,934,439.
Rabewerk Heinrich Clausing: *See—*
Becker, Ignaz Albert Josef, 3,934,653.
Rabinowitz, Azriel Jay, to Sybron Corporation. Adjustable dental chair. 3,934,929, Cl. 297-75.000.
Rabus, Kurt, to Siemens Aktiengesellschaft. Polyphase liquid rheostat. 3,935,554, Cl. 338-80.000.
Racz, Nick S. Cookware containers. 3,934,748, Cl. 220-9.00R.
Radford, Troy Richard: *See—*
Mooney, John Russell; and Radford, Troy Richard, 3,934,701.
Radke, Edward. Door guard. 3,934,910, Cl. 292-346.000.
Radutsky, Grigory Avramovich: *See—*
Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,934,709.
Rady, David M. Bi-level book stand. 3,934,806, Cl. 248-441.000.
Raffel, Marvin J. Bed frame with readily connectable vibrator motors. 3,934,283, Cl. 5-109.000.
Rahall, George A., to United States Steel Corporation. Method and apparatus for flame-cutting angle irons. 3,934,861, Cl. 266-23.00R.
Raleigh Industries Limited: *See—*
Hillyer, Anthony William, 3,934,493.
Randolph, Thomas M.: *See—*
Miller, Ronald J.; and Randolph, Thomas M., 3,935,558.
Ranft, Ernst L.: *See—*
Beiswenger, David W.; Paddock, Gordon R.; and Ranft, Ernst L., 3,934,413.
Rank Xerox Ltd.: *See—*
Fukuzawa, Hideo, 3,934,546.
Miller, Laurence G.; and Smith, Vernon J., 3,934,870.
Rapistan Incorporated: *See—*
Bowman, Clyde L., 3,934,707.
Rapp, James Erich, to Owens-Illinois, Inc. Glasses and glass-ceramics. 3,935,019, Cl. 106-47.00R.
Raser, William H. Spinning-disk shaft position encoder. 3,935,570, Cl. 340-347.00P.
Rashbrook, Robert Benson, to Imperial Chemical Industries Limited. Process for preparing polyesters from terephthalic acid in the presence of phosphonium compounds. 3,935,168, Cl. 260-75.00P.
Rasmussen, Jerome J. M.: *See—*
Chiu, Herman S.; and Rasmussen, Jerome J. M., 3,935,320.
Ratliff, Richard L., to Clark Equipment Company. Resistance-producing structure for a transmission shifting mechanism. 3,934,485, Cl. 74-473.00R.
Rautimo, Pentti J.; and Kapanen, Aarne A., to Outokumpu Oy. Device for detaching an electrolytically percipitated metal sheet from a cathode. 3,935,091, Cl. 204-281.000.
Ravicchio, Donald P.; and Geary, Carl H., to Carrier Corporation. End wall closure apparatus. 3,934,752, Cl. 220-328.000.
Ray, Neil Hunter; and Robinson, William Derek, to Imperial Chemical Industries Limited. Glasses. 3,935,018, Cl. 106-47.00R.
Raymond Lee Organization, Inc., The: *See—*
Bruce, Donald G., 3,934,804.
Tortorello, Albert, 3,934,300.
Vernhout, Hendrik J., 3,935,052.

Raymond, Roger S.: *See—*
Hamilton, Charles Howard; Koeller, Fred B.; Raymond, Roger S.; and Goldberg, Martin, 3,934,441.
Raypak, Inc.: *See—*
Shippey, Frank R.; Vance, Timothy C.; and Martin, Fred E., 3,934,906.
RCA Corporation: *See—*
Hopkins, Gorden Lambert, 3,935,591.
Johnson, Henry Charles, 3,935,573.
McNamee, James Arthur, 3,934,902.
Poliniak, Eugene Samuel; Scheible, Howard George; and Himics, Richard Joseph, 3,935,331.
Poliniak, Eugene Samuel; and Himics, Richard Joseph, 3,935,332.
Smith, Theodore Dennis, 3,934,544.
Rebeiz, Constantin Anis, to University of Illinois Foundation. In vitro net bioxynthesis of chlorophyll and grana. 3,934,369, Cl. 47-58.000.
Rebmann, Manfred, to Robert Bosch G.m.b.H. Apparatus for dosing and dispensing granular material into capsules. 3,934,764, Cl. 222-451.000.
Reed, Kenneth E., to Delavan Manufacturing Corporation. Low drift spray nozzle and method. 3,934,823, Cl. 239-472.000.
Reed, Winthrop B., to General Steel Industries, Inc. Method and apparatus for bending elongated members. 3,934,450, Cl. 72-383.000.
Reen, Robert Richard, to ICI United States Inc. Method of preparing polyester powder. 3,935,169, Cl. 260-75.00T.
Regester, Willard D. Tooth cleaning device. 3,934,299, Cl. 15-104.940.
Regie Nationale des Usines Renault: *See—*
Langlois, Christian, 3,934,963.
Pruvot, Francois Claude, 3,934,948.
Reichenbacher, Paul H.; Forsythe, Theresa M.; Sparks, Allen K.; and Symon, Ted, to Universal Oil Products Company. Chemical condensation improvement. 3,935,234, Cl. 260-343.20R.
Reiff, Helmut: *See—*
Noll, Klaus; Schroer, Walter; Pedain, Josef; and Reiff, Helmut, 3,935,146.
Reighart II, Ray R. Free vortex aircraft. 3,934,844, Cl. 244-40.00A.
Reilly, Albert F.; Doddridge, Ivan C.; and Chen, Ming Chih, to Sheller-Globe Corporation. Method of manufacturing new paintable rubber products. 3,935,329, Cl. 427-35.000.
Reiser, Robert. System for producing variable static light displays. 3,934,366, Cl. 40-130.00B.
Reliance Electric Company: *See—*
Tooley, Robert W., 3,934,953.
Rende, Richard F., to American Hospital Supply Corporation. Automatic computing ocular tonometer system. 3,934,462, Cl. 73-80.000.
Repke, Virginia L.: *See—*
Mesek, Frederick K.; Repke, Virginia L.; and Strickel, William R., 3,934,588.
Research Technology Incorporated: *See—*
Bowen, Howard; and Spinner, Frederick W., 3,935,468.
Ress, Thomas I., to Kreidl Chemico Physical K.G., The. Particle accelerator. 3,935,503, Cl. 315-111.600.
Reunanen, Matti Antero, to Wallac Oy. Method for calibration measurement in a liquid scintillation counter and carrier used in the method. 3,935,449, Cl. 250-252.000.
Revesz, Istvan, to Alfa-Laval AB. Control for vacuum system. 3,934,607, Cl. 137-489.500.
Reynolds, David: *See—*
Lesko, Richard; and Reynolds, David, 3,935,413.
Reynolds, David E. Leak detection apparatus. 3,935,567, Cl. 340-242.000.
Reynolds Metals Company: *See—*
Vryland, George W., 3,934,395.
Rhee, Jhoon. Protective helmet. 3,934,271, Cl. 2-3.00R.
Rheinisch-Westfalisches Elektrizitatswerk AG: *See—*
Fritz, Heinz Peter; and Missol, Detlef, 3,935,082.
Rheinlander, Paul; and Voigt, Heinz, to Thermo-Industrie GmbH & Co. KG. Method and device for preventing slag from escaping when emptying a pouring vessel. 3,934,755, Cl. 222-1.000.
Rhodes, Richard O.: *See—*
Ford, Freeman A.; Armstrong, Errol; and Rhodes, Richard O., 3,934,323.
Rhone-Poulenc Industries: *See—*
Biola, Georges; Buathier, Bernard; Combes, Andre; and Martin, Michel, 3,935,276.
Rhone-Poulenc S.A.: *See—*
Boesch, Roger, 3,935,315.
Chapurlat, Robert, 3,935,272.
Rhone-Poulenc-Textile: *See—*
Bizot, Jean; and Sausse, Andre, 3,935,092.
Rhone-Progil: *See—*
Strini, Jean-Claude; and Costes, Jean-Raymond, 3,935,286.
Rice, Harry E.; and Rude, John K., to Technicolor, Inc. Printer control. 3,935,434, Cl. 235-92.0CT.
Rice, Robert C. Scaffold structure. 3,934,676, Cl. 182-182.000.
Richter, Harvey E., to Tec Group, Inc., The. Unit and method for spray cooling fluid. 3,935,156, Cl. 261-37.000.
Ridyard, Denis Robert Annesley: *See—*
Manson, John Stuart; and Ridyard, Denis Robert Annesley, 3,935,248.
Rieckmann, Peter: *See—*
Groppenbacher, Gregor; Rieckmann, Peter; and Rothe, Werner, 3,935,326.
Riegel, Herbert, to Lummus Company, The. Production of olefinic halides. 3,935,288, Cl. 260-656.00R.
Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Fixed bearing assembly for a tiltable-converter carrying trunnion. 3,934,955, Cl. 308-72.000.
Riemersma, Henry; and Farish, Owen, to Westinghouse Electric Corporation. High pressure gas laser using uniform field electrode configuration with irradiation by corona discharge. 3,935,547, Cl. 331-94.5PE.
Rieter Machine Works Ltd.: *See—*
Bruggisser, Klaus; Graf, Felix; and Ruegg, Albert, 3,934,831.
Rifkin, Michael, to Magne-Lok Co., The. Lock with retainer. 3,934,908, Cl. 292-150.000.
Riverside Laboratories, Inc.: *See—*
Schmidt, Robert L.; and Beckman, Hubert J., 3,935,049.
Riverside Press, Inc., The: *See—*
O'Neal, Cothburn M., 3,934,794.
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,935,426.
Robert Bosch G.m.b.H.: *See—*
Hofmann, Karl; and Mladek, Walter, 3,934,903.
Kizler, Harald; Przybyla, Bernd; and Schmidt, Peter-Jurgen, 3,935,538.
Rebmann, Manfred, 3,934,764.
Romann, Peter; and Nagele, Erwin, 3,934,561.
Schnaibel, Eberhard, 3,934,940.
Zechnall, Richard; Linder, Ernst; Schmid, Albert; Raabe, Gotthold; Kerner, Karl; and Socknick, Rudi, 3,935,444.
Roberts, Francis D.; and Steinke, John J., III, to Colgate-Palmolive Company. Toothpaste formulations. 3,935,306, Cl. 424-49.000.
Roberts, Rene: *See—*
Gerkin, Richard M.; Roberts, Rene; and Hodges, Joy C., 3,935,132.
Robertshaw Controls Company: *See—*
Bauer, Frederick T.; Cairo, Anthony C.; Holkeboer, Ronald E.; and Tyler, Gary E., 3,935,473.
Caldwell, Edward N., 3,934,613.
Wolfe, Denis G.; Tyler, Hugh J.; Jackson, Wilbur F., deceased; and Benton, Linda A., trust administrator, 3,934,417.
Robertson, Reed S.; and Watson, William R., to Nalco Chemical Company. Constant temperature cold-end corrosion probe. 3,934,646, Cl. 165-105.000.
Robertson, William J., to Shell Oil Company. Process for the preparation of pressure-sensitive adhesive articles. 3,935,338, Cl. 427-207.000.
Robinson, Morton: *See—*
Pastor, Ricardo C.; Arita, Kaneto; and Robinson, Morton, 3,935,302.
Robinson, William Derek: *See—*
Ray, Neil Hunter; and Robinson, William Derek, 3,935,018.
Roccaforte, Harry I., to Hoerner Waldorf Corporation. Display carton for tubes. 3,934,719, Cl. 206-45.140.
Rockwell International Corporation: *See—*
Cantley, George, 3,934,488.
Hamilton, Charles Howard; Koeller, Fred B.; Raymond, Roger S.; and Goldberg, Martin, 3,934,441.
Jovick, Raymond John, 3,934,685.
McCloskey, Albert R., 3,934,954.
Tosches, Anthony J., 3,934,621.
Rockwood Systems Corporation: *See—*
Sanderson, Ian S.; and Hardy, John C., 3,934,604.
Rodgers, Earl Edward; and Mellinger, Gerald Allen, to United Conveyor Corporation. Capacitance type material level detector for hoppers. 3,934,475, Cl. 73-304.00C.
Roe, Norman E.: *See—*
Kwan, Gerald A.; Penkov, Walter V.; and Roe, Norman E., 3,934,370.
Rohm & Haas Company: *See—*
Jones, Edward, 3,934,767.
Rohr, Andre: *See—*
Falk, Jean-Pierre; and Rohr, Andre, 3,935,512.
Rohr, Wolfgang: *See—*
Fischer, Adolf; Hansen, Hanspeter; and Rohr, Wolfgang, 3,935,190.
Rolls-Royce Motors Limited: *See—*
Coulson, Derrick; and Coyle, John C., 3,934,642.
Rolls-Royce (1971) Limited: *See—*
Smith, Stanley, 3,934,889.
Romani, Edward Paul, to Hoffmann-La Roche Inc. Fetal heart rate monitoring apparatus. 3,934,577, Cl. 128-2.05T.
Romann, Peter; and Nagele, Erwin, to Robert Bosch G.m.b.H. Fuel injection system for internal combustion engines with combined fuel pump control switch. 3,934,561, Cl. 123-32.0EA.
Romanski, Lon H.: *See—*
Cushman, Walton W., 3,934,515.
Rongved, Leif: *See—*
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,934,949.
Roof, Lewis B., to Phillips Petroleum Company. Acid and alcohol carrier for HF-H_2O chromatographic separation using anion exchange resin. 3,935,097, Cl. 210-31.00C.
Ropers, Johann: *See—*
Keller, Wolfgang; Kruger, Joachim; Ropers, Johann; and Schabert, Hans-Peter, 3,935,062.

Roscoe, Theodore J., Jr.: *See—*
Curington, Alfred R.; and Roscoe, Theodore J., Jr., 3,934,662.

Rosenbaum, Fred J.; and Wu, You-Sun, to Washington University, The. Wide-band microwave circulator. 3,935,548, Cl. 333-1.100.

Rosenthal, Rudolph; and Sorgenti, Harold A., to Atlantic Richfield Company. Process for preparing diperoxide from an organic hydroperoxide and a ketone. 3,935,278, Cl. 260-610.00R.

Rosin, Alexander, to Northrop Corporation. Gun bay pressure relief device. 3,934,845, Cl. 244-129.00D.

Ross, Howard J.: *See—*
Kalpin, Thomas G.; and Ross, Howard J., 3,934,632.

Ross, Jack. Water powered dishwasher. 3,934,822, Cl. 239-226.000.

Rossen, Jack L.: *See—*
Sakler, Stephen Allen; Porcello, Samuel Joseph; and Rossen, Jack L., 3,935,321.

Rothe, Werner: *See—*
Groppenbacher, Gregor; Rieckmann, Peter; and Rothe, Werner, 3,935,326.

Rottger, Hans: *See—*
Muller, Otto; Rottger, Hans; Kastl, Hans; and Hagen, Hans-Gunter, 3,934,731.

Rowe, Edward A.: *See—*
Beckers, Norman L.; and Rowe, Edward A., 3,935,287.

Rowe, George E., deceased (by Rowe, Selma S., executrix), to Emhart Corporation. Neck ring cartridge for glassware machine. 3,934,998, Cl. 65-172.000.

Rowe, Selma S., executrix: *See—*
Rowe, George E., deceased, 3,934,998.

Rowekamp, Edward F., to Lodge & Shipley Company, The. Carriage for lifting and spreading rows of articles. 3,934,920, Cl. 294-87.00R.

Rowland Development Corporation: *See—*
Rowland, William P., 3,935,359.

Rowland, William P., to Rowland Development Corporation. Retroreflective sheeting and method and apparatus for producing same. 3,935,359, Cl. 428-172.000.

Rubel, Manfred: *See—*
Leisterer, Reinhard; Mahlstedt, Walter; and Rubel, Manfred, 3,935,575.

Rubenstein, Kenneth Edward; and Leute, Richard K., to Syva Company. Antibody steric hindrance immunoassay with two antibodies. 3,935,074, Cl. 195-103.50R.

Rucker, George I., to Crown Zellerbach Corporation. Method for forming containers with fin-type seams. 3,935,048, Cl. 156-203.000.

Rude, John K.: *See—*
Rice, Harry E.; and Rude, John K., 3,935,434.

Rudolf Hell GmbH: *See—*
Fels, Werner, 3,935,584.

Rudolphy, Albert, to Hoechst Aktiengesellschaft. Process for the manufacture of modified natural resin products. 3,935,145, Cl. 260-27.0BB.

Ruegg, Albert: *See—*
Bruggisser, Klaus; Graf, Felix; and Ruegg, Albert, 3,934,831.

Ruest, Dennis A.; Shen, C. Y.; and Mason, John L., to Monsanto Company. Chemical compounds. 3,935,257, Cl. 260-535.00P.

Rufenacht, Kurt, to Ciba-Geigy Corporation. 4H-Pyrido[3,2a]-1,3,2-dioxophosphorane derivatives. 3,935,224, Cl. 260-294.80C.

Ruhrchemie AG: *See—*
Tummes, Hans; Falbe, Jurgen; and Cornils, Boy, 3,935,285.

Rumell, James A. Transport vehicle with tiltable chassis. 3,934,740, Cl. 214-505.000.

Rundqvist, Lars-Goran; and Jakobson, Karl Folke Olof, to AB Celleco. Straining apparatus. 3,935,109, Cl. 210-406.000.

Russell, Charles E.; Russell, Fred E.; and Pearson, Melvin B., to Waste Water Systems, Inc. Automatic foam remover for flotation tanks. 3,935,104, Cl. 210-97.000.

Russell, Fred E.: *See—*
Russell, Charles E.; Russell, Fred E.; and Pearson, Melvin B., 3,935,104.

Ryobi, Ltd.: *See—*
Honkawa, Yoshinori, 3,934,872.

Sadeski, Boleslaus J.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,934,705.

Saeki, Shiro: *See—*
Takahashi, Sakae; Saeki, Shiro; and Onisawa, Yoshio, 3,935,143.

Safir, Sidney Robert: *See—*
Fanshawe, William Joseph; and Safir, Sidney Robert, 3,935,211.

SAFT-Societe des Accumulateurs Fixes et de Traction: *See—*
Sperandio, Francis, 3,935,030.

Saito, Chuichi; and Nakao, Schoichi, to Hitachi, Ltd. Handrail safety device. 3,934,699, Cl. 198-16.000.

Saito, Katushi: *See—*
Tanaka, Tadashi; Oka, Joji; and Saito, Katushi, 3,935,035.

Sakakibara, Ryuji: *See—*
Hashimoto, Sadao; Sakakibara, Ryuji; Kurashige, Yasushi; Takikawa, Katsuo; Osame, Yoko; Minami, Hiroshi; and Suzue, Takashi, 3,935,266.

Sakharov, Boris Alexandrovich: *See—*
Loschilin, Evgeny Dmitrievich; Galperin, Alexandr Lvovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and Sakharov, Boris Alexandrovich, 3,934,619.

Sakler, Stephen Allen; Porcello, Samuel Joseph; and Rossen, Jack L., to Nabisco, Inc. Accelerated cooling method. 3,935,321, Cl. 426-244.000.

Salemme, Fred J., to California Cedar Products Company Inc. Mechanical apparatus for cutting moving work. 3,934,628, Cl. 144-2.00R.

Salter, Joseph Lane: *See—*
George, Emanuel John; Salter, Joseph Lane; Sauer, Earl Salvator; and Tidd, Charles Edward, Jr., 3,935,369.

Samatov, Jury Petrovich: *See—*
Egorov, Jury Dmitrievich; Kavyarov, Ivan Savvateevich; Samatov, Jury Petrovich; Chasovodov, Nikolai Alexandrovich; and Chirikhin, Jury Ivanovich, 3,934,665.

Samuel, Joseph, to Lem Instrument Corporation. Universal analog-to-digital converter using the same information disc for different output codes. 3,935,568, Cl. 340-347.00P.

Samways, Albert John: *See—*
High, Robert Edward; and Samways, Albert John, 3,934,792.

Samyn, Celeste: *See—*
Marvel, Carl S.; and Samyn, Celeste, 3,935,167.

Sanders Associates, Inc.: *See—*
Schmitt, Joseph W.; and Starkey, Donald L., 3,935,437.

Sanderson, Ian S.; and Hardy, John C., to Rockwood Systems Corporation. Proportioning apparatus. 3,934,604, Cl. 137-98.000.

Sandham, Edwin C., to Leggett & Platt, Incorporated. Back support for chair. 3,934,930, Cl. 297-291.000.

Sandoz, Inc.: *See—*
Houlihan, William J.; and Linder, Jerome, 3,935,210.

Sandoz Ltd.: *See—*
Schelling, Hans-Peter; and Schaub, Fritz, 3,935,271.

Sandoz Ltd., (Sandoz AG): *See—*
Avar, Lajos; and Hofer, Kurt, 3,935,231.

Sandstrom, Stig Rune. Means for guiding the welding unit of an automatic welding apparatus along the joint line between workpieces to be welded together. 3,935,420, Cl. 219-125.00R.

Sankyo Company Limited: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,935,311.

Sano, Tadashi: *See—*
Nishimura, Izuhiko; and Sano, Tadashi, 3,934,399.

Sargent Industries, Inc.: *See—*
Turner, Peter H., 3,934,958.

Sargent, Raymond W., to Simmonds Precision Products, Inc. Electro-visual indicators. 3,935,571, Cl. 340-373.000.

Sasaki, Koju; and Kobayashi, Akihiro, to Nittan Company, Ltd. Ionization smoke detector. 3,935,492, Cl. 313-54.000.

Sasaki, Kyozo; and Murayama, Minoru. Sporting shoes. 3,934,346, Cl. 36-2.50R.

Sate-Life Mfg. Co.: *See—*
May, Louis; and Idzik, Edmund M., 3,934,541.

Sate-Lite, Mfg. Co.: *See—*
May, Louis; and Idzik, Edmund M., 3,934,542.

Satkin, Jeff, to Lawrence Peska Associates, Inc., a part interest. Method of and apparatus for attaching fasteners for cloth and the like. 3,934,329, Cl. 29-453.000.

Sato, Kenji: *See—*
Kaji, Tetsunori; and Sato, Kenji, 3,935,590.

Sauer, Earl Salvator: *See—*
George, Emanuel John; Salter, Joseph Lane; Sauer, Earl Salvator; and Tidd, Charles Edward, Jr., 3,935,369.

Sauerwein, William D.; and Sides, Daniel Harrison, to Black and Decker Manufacturing Company, The. Dust cup. 3,934,661, Cl. 175-211.000.

Sauerwein, William D.: *See—*
Sides, Daniel Harrison; and Sauerwein, William D., 3,934,688.

Saunders, Philip G.; and Simpson, Jack R., to Container Graphics Corporation. Mounting means for a printing plate. 3,934,509, Cl. 101-415.100.

Saunders, Thomas Edward: *See—*
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,934,949.

Saunders, William T., to National Steel Corporation. Manufacturing methods for selective coating characteristic tinplated steel cans. 3,934,527, Cl. 113-120.00A.

Sausse, Andre: *See—*
Bizot, Jean; and Sausse, Andre, 3,935,092.

Schabert, Hans-Peter: *See—*
Keller, Wolfgang; Kruger, Joachim; Ropers, Johann; and Schabert, Hans-Peter, 3,935,062.

Schade, Gerhard, to Dynamit Nobel Aktiengesellschaft. Process for the stabilization of polyester amides. 3,935,165, Cl. 260-45.85B.

Schady, Joseph L., to Alpha Sheet Metal Works, Inc. Apparatus for enrobing discrete objects. 3,934,545, Cl. 118-19.000.

Schaeffer-Homberg GmbH, Firma: *See—*
Kramer, Friedhelm; and Wolfertz, Gunter, 3,934,777.

Schatz, Douglas S.: *See—*
McDonough, George W.; Schatz, Douglas S.; and Anderson, Emmett R., 3,935,412.

Schaub, Fritz: *See—*
Schelling, Hans-Peter; and Schaub, Fritz, 3,935,271.

Schedlitzki, Dietmar: *See—*
Mitgau, Rotger; Petrik, Bruno; and Schedlitzki, Dietmar, 3,935,336.

Scheffel, Kurt, to Grey Lab. Establishment, The. Apparatus for the storage and reading of data combined from binary numbers. 3,935,431, Cl. 235-61.11A.

Scheiber, Robert: *See—*
Cap, Heinrich; Krammer, Herbert; and Scheiber, Robert, 3,935,524.

Scheible, Howard George: *See—*
Poliniak, Eugene Samuel; Scheible, Howard George; and Himics, Richard Joseph, 3,935,331.

Schelling, Hans-Peter; and Schaub, Fritz, to Sandoz Ltd. Unsaturated aliphatic ketones. 3,935,271, Cl. 260-594.000.

Schenk, Raymond L., Jr.: *See—*
Cushman, Robert Holbrook; and Schenk, Raymond L., Jr., 3,934,782.

Schering Aktiengesellschaft: *See—*
Engelfried, Otto; Nieuweboer, Bob; Petzoldt, Karl; Kerb, Ulrich; and Lubke, Klaus, 3,935,245.

Schiller, Paul; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Polycarbonate resin having improved electrical tracking resistance. 3,935,157, Cl. 260-37.0PC.

Schindl, Klaus P., to C. Reichert Optische Werke AG. System for making composite photomicrographs. 3,935,011, Cl. 96-41.000.

Schlag, Johannes: *See—*
Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, 3,935,161.

Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, to BASF Aktiengesellschaft. Process for stabilizing polyamides. 3,935,161, Cl. 260-45.9NC.

Schlosser, Fritz Dieter, to African Explosives & Chemical Industries Limited. Auto-condensation products of urea. 3,935,260, Cl. 260-553.00B.

Schlumberger Technology Corporation: *See—*
Brieger, Emmet F., 3,934,468.
Nicolas, Yves, 3,934,467.

Schmid, Albert: *See—*
Zechnall, Richard; Linder, Ernst; Schmid, Albert; Raabe, Gotthold; Kerner, Karl; and Socknick, Rudi, 3,935,444.

Schmid, Paul; and Droesch, Albert, to GHH Basel AG. Enclosed filtering unit for filtering and/or treating liquid or gaseous media. 3,935,110, Cl. 210-445.000.

Schmidt, Arthur D.: *See—*
Snyder, Alan Kent; Schmidt, Arthur D.; Foote, Seldon T., deceased; and Clipp, Robert R., executor, 3,934,702.

Schmidt, Gunter, to Production, Inc. Daylight film handling system. 3,934,735, Cl. 214-6.00D.

Schmidt, Manfred: *See—*
Riegler, Ernst; and Schmidt, Manfred, 3,934,955.

Schmidt, Peter: *See—*
Keilhack, Hans O.; and Schmidt, Peter, 3,934,837.

Schmidt, Peter-Jurgen: *See—*
Kizler, Harald; Przybyla, Bernd; and Schmidt, Peter-Jurgen, 3,935,538.

Schmidt, Robert L.; and Beckman, Hubert J., to Ashland Oil, Inc.; and Riverside Laboratories, Inc. Method of covering a substrate by overidge bonding of a covering material about the edges of the substrate. 3,935,049, Cl. 156-216.000.

Schmitt, Joseph W.; and Starkey, Donald L., to Sanders Associates, Inc. Signal processor. 3,935,437, Cl. 235-152.000.

Schmitz, Theo: *See—*
Thiersch, Friedrich; Strobel, Manfred; and Schmitz, Theo, 3,935,078.

Schnaibel, Eberhard, to Robert Bosch G.m.b.H. Safety interlock circuit for switching brake antilock systems in a tractor trailer vehicle combination in and out. 3,934,940, Cl. 303-21.00R.

Schnick, Leslie E.: *See—*
Wilson, Michael C.; and Schnick, Leslie E., 3,934,631.

Schoen, Lowhardt A. A., to Stamicarbon B.V. Process for chlorinating ethylene polymers. 3,935,181, Cl. 260-94.90H.

Scholz, Kurt: *See—*
Hagenweiler, Kurt; and Scholz, Kurt, 3,935,144.

Schonung, Arnold: *See—*
Brenneisen, Jorg; and Schonung, Arnold, 3,935,528.

Schornhorst, James R.: *See—*
Muhlstadt, William J.; and Schornhorst, James R., 3,934,994.

Schott, Lawrence A.: *See—*
Schott, Roger A.; and Schott, Lawrence A., 3,934,677.

Schott, Roger A.; and Schott, Lawrence A. Magnet for guiding lubricating head on a chain to be lubricated. 3,934,677, Cl. 184-15.00R.

Schraudolph, Manfred: *See—*
Henniger, Wolfgang; Povh, Dusan; and Schraudolph, Manfred, 3,935,551.

Schrock, Donald C., to Crane Co. Bathtub support. 3,934,278, Cl. 4-173.000.

Schroer, Walter: *See—*
Noll, Klaus; Schroer, Walter; Pedain, Josef; and Reiff, Helmut, 3,935,146.

Schroter, Hans O. Spring assisted variable ratio brake operating lever system. 3,934,490, Cl. 74-520.000.

Schubert, Paul; and Treipl, Hans, to Cross Europa-Werk GmbH. Transfer line. 3,934,700, Cl. 198-19.000.

Schudel, Peter: *See—*
Bertele, Erhard; and Schudel, Peter, 3,935,275.

Schuler, Paul A., to General Electric Company. Cutting inserts. 3,934,319, Cl. 29-95.00R.

Schurger, Rainer: *See—*
Walter, Lothar; and Schurger, Rainer, 3,934,947.

Schwalbe, Julien I.: *See—*
Antonini, Frank P.; and Schwalbe, Julien I., 3,934,715.

Schwartz, Daniel M.; and Cross, John W., to Lockheed Missiles & Space Company, Inc. Articulated vehicle coupler. 3,934,667, Cl. 180-14.00A.

Schweitzer, Earl O.: *See—*
Novak, Frank A.; Schweitzer, Earl O.; and Naik, Kamal, 3,934,692.

Schwope, Arthur D.: *See—*
Wise, Donald L.; Schwope, Arthur D.; and Sell, Kenneth W., 3,935,308.

SCM Corporation: *See—*
Gilmore, Cecilia; and Miller, Donald E., 3,935,325.
Mueller, Hans W.; and Shattuck, Richard E., 3,934,696.

Scott, Garland E., Jr.; and Levenson, Michael K., to General Electric Company. Chemically polished polycrystalline alumina material. 3,935,495, Cl. 313-220.000.

Scott Paper Company: *See—*
Gray, Robert D., 3,935,057.

Scuderi, Rudolph: *See—*
Michelet, Robert Wilson; Ostapiak, Roman; and Scuderi, Rudolph, 3,935,527.

Seagrave Corporation, The: *See—*
French, Walter K., 3,934,995.

Sealectro Corporation: *See—*
Stand, Mille; and Davis, Stephen U., 3,935,418.

Sebenik, Roger Frank: *See—*
Lippman, Alfred; Toth, Charles; and Sebenik, Roger Frank, 3,935,297.

Segawa, Masahiro: *See—*
Yoshida, Masafumi; Segawa, Masahiro; and Obara, Hiroshi, 3,935,485.

Sekimura, Nobuyuki: *See—*
Itoh, Susumu; Nishida, Keijiro; Kamiya, Osamu; and Sekimura, Nobuyuki, 3,934,961.

Sekiwa, Tetsuo: *See—*
Beppu, Tatsuro; Iwamoto, Masami; and Sekiwa, Tetsuo, 3,935,039.

Selak, Martin, to Astro Engineering Corporation. Top loading, continuous suction feeder attachment for printing apparatus. 3,934,868, Cl. 271-9.000.

Sell, Kenneth W.: *See—*
Wise, Donald L.; Schwope, Arthur D.; and Sell, Kenneth W., 3,935,308.

Sellstedt, John H., to American Home Products Corporation. Intermediates for producing semi-synthetic penicillins and cephalosporins and methods of production. 3,935,186, Cl. 260-239.100.

Senolt, Hans; Tomaschko, Heinrich; and Palvik, Georg, to Osterreichische Mineralolverwaltung Aktiengesellschaft. Bitumen blowing. 3,935,093, Cl. 208-6.000.

Serizawa, Akio, to Sony Corporation. Tape cassette. 3,934,839, Cl. 242-198.000.

Servo Corporation of America: *See—*
Maynard, Robert L., 3,935,432.

Seydelmann, Ludwig. Die for two-stage food chopper. 3,934,827, Cl. 241-84.000.

Seymour, David J.: *See—*
Kossa, Miklos M.; and Seymour, David J., 3,934,530.

Shakely, Conrad Dale: *See—*
Goffredo, Daniel L.; and Shakely, Conrad Dale, 3,935,041.

Shapiro, Stanley L.: *See—*
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Sharma, Mohinder Paul: *See—*
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Sharma, Raj Kumar: *See—*
Prevorsek, Dusan Cyril; Kwon, Young Doo; and Sharma, Raj Kumar, 3,934,452.

Sharman, Samuel H., to Chevron Research Company. High sudsing phosphate-free detergent composition. 3,935,131, Cl. 252-555.000.

Sharpe, William E., Jr.: *See—*
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Shattuck, Richard E.: *See—*
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Shaw, Bernard Elliott, to Fullerton, Hodgart & Barclay Ltd. Mine hoists. 3,934,856, Cl. 254-184.000.

Shaw, Clarence W., to J. Ray McDermott & Co., Inc. Marine fluid transfer apparatus. 3,934,289, Cl. 9-8.00P.

Shell Oil Company: *See—*
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Sheller-Globe Corporation: *See—*
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Shen, C. Y.: *See—*
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Sheratte, Martin B., to McDonnell Douglas Corporation. Functional fluid compositions. 3,935,116, Cl. 252-78.000.

Sheridan, Arthur L., to Union Carbide Corporation. Zone regulation of casing inflation gas. 3,934,309, Cl. 17-42.000.

Sherwin, Leo H.; and Gilmore, Robert S., to General Electric Company. Apparatus for focusing and collimating ultrasonic waves. 3,934,460, Cl. 73-71.5US.

Sherwood Products Corporation: *See—*
Howard, Durrell U., 3,934,543.

Shida, Tomohiko: *See—*
Umino, Tomio; Suzuki, Munenobu; and Shida, Tomohiko, 3,935,417.

Shillingford, John T., Jr.: *See—*
Dahlen, John M.; Toth, William E.; Shillingford, John T., Jr.; and McKenna, John F., Jr., 3,935,592.

Shimazu, Ken-ichi: *See*—
Gumbinner, Robert; and Shimazu, Ken-ichi, 3,935,080.

Shimba, Hiroshi: *See*—
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Yoshikawa, Kanji; Tatsukami, Yoshiharu; Shimba, Hiroshi; and Mukunashi, Hiroaki, 3,935,374.

Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Kimura, Hiroyuki, to Nippon Steel Corporation. Method for manufacturing non-oriented electrical steel sheet and strip having no ridging. 3,935,038, Cl. 148-110.000.

Shindo, Noboru; and Hashizume, Hiroshi, to Murata Kikai Kabushiki Kaisha. False twisting spindle. 3,934,398, Cl. 57-77.300.

Shinohara, Terumi: *See*—
Narui, Hiroshi; and Shinohara, Terumi, 3,935,334.

Shinomura, Toshihiko, to Nippon Oil Company Ltd. Process for the preparation of a synthetic wood. 3,935,047, Cl. 156-163.000.

Shippey, Frank R.; Vance, Timothy C.; and Martin, Fred E., to Raypak, Inc. Means for coupling and sealing membrane carrying tube sections. 3,934,906, Cl. 285-371.000.

Shock V Automatic Lubrication Systems, Inc.: *See*—
Murphy, William C., 3,934,600.

Shoji, Shoji: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; and Shoji, Shoji, 3,935,298.

Shore, Sidney X.; and Martin, Paul S. Acoustic headsets. 3,934,674, Cl. 181-135.000.

Shore, Sidney X.; and Martin, Paul S. Earpiece for acoustic headset. 3,935,401, Cl. 179-182.00R.

Shotton, James A., to Phillips Petroleum Company. Density control for electroplatable polymer compositions. 3,935,081, Cl. 204-30.000.

Shuey, David R.; and Slomcenski, Robert J., to Xerox Corporation. Automatic zeroing electrometer. 3,935,532, Cl. 324-72.000.

Shultz, Andrew; and Wizemann, Leslie C., to Allied Chemical Corporation. Finely divided colorants. 3,934,973, Cl. 8-79.000.

Sides, Daniel Harrison; and Sauerwein, William D., to Black and Decker Manufacturing Company, The. Shifter mechanism. 3,934,688, Cl. 192-48.500.

Sides, Daniel Harrison: *See*—
Sauerwein, William D.; and Sides, Daniel Harrison, 3,934,661.

Sidorov, Jury Ivanovich: *See*—
Korovin, Stanislav Konstantinovich; Kruglov, Igor Ivanovich; Preobrazhentsev, Konstantin Andreevich; Sidorov, Jury Ivanovich; and Fronk, Stanislav Vladislavovich, 3,935,585.

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Keller, Wolfgang; Kruger, Joachim; Ropers, Johann; and Schabert, Hans-Peter, 3,935,062.
Klauke, Guenter; Marziniak, Ruediger; and Guerke, Guenter, 3,934,781.
Muller, Otto; Rottger, Hans; Kastl, Hans; and Hagen, Hans-Gunter, 3,934,731.
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Sierracin Corporation, The: *See*—
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Sihtola, Hannes. Method for the removal of hemicellulose from hemicellulose-containing caustic liquors. 3,935,022, Cl. 106-163.000.

Silcox, William H.: *See*—
Horton, Edward E.; Brewer, John H.; Silcox, William H.; and Hudson, T. A., 3,934,528.

Silverman, Daniel. Vibrator systems for generating elastic waves in the earth. 3,934,673, Cl. 181-119.000.

Simmonds Precision Products, Inc.: *See*—
Sargent, Raymond W., 3,935,571.

Simmons, Allen P. Illuminated animal collar and leash. 3,935,443, Cl. 240-6.40W.

Simmons, Jimmy W. Shower curtain holder. 3,934,636, Cl. 160-349.00R.

Simo, Stephen G., to Allis-Chalmers Corporation. Gas conditioner and analyzer. 3,934,454, Cl. 73-29.000.

Simons, Leon, to NL Industries, Inc. Method and apparatus for forming vibration-resistant thread-forming screw. 3,934,444, Cl. 72-88.000.

Simpson, Jack R.: *See*—
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Singer Company, The: *See*—
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Sjoberg, Berndt Olof Harald: *See*—
Dahlen, Sven Erik; Ekstrom, Bertil Ake; Kovacs, Odon Kalman Jozsef; and Sjoberg, Berndt Olof Harald, 3,935,204.

SKF Industrial Trading and Development Company, B.V.: *See*—
Asberg, Sture Lennart, 3,934,966.
Kuhlmann, Wolf, 3,934,950.
Walter, Lothar; and Schurger, Rainer, 3,934,947.

Slomcenski, Robert J., to Xerox Corporation. Electrometer with low voltage indicator. 3,935,531, Cl. 324-72.000.

Slomcenski, Robert J.: *See*—
Shuey, David R.; and Slomcenski, Robert J., 3,935,532.

Smilgys, Bruno S., to Veeder Industries, Inc. Settable variator drive mechanism. 3,934,491, Cl. 74-681.000.

Smith, Arthur W., to TransTechnology Corporation. Self-erecting material handling sling. 3,934,919, Cl. 294-74.000.

Smith, Baynard R., to Electro Oxide Corporation. Bonded gold article composition for bonding gold to a ceramic substrate utilizing copper oxide and cadium oxide. 3,935,366, Cl. 428-328.000.

Smith, Bert A.; and Getz, Paul C., to Smith-Schreyer & Assoc., Inc. Access insert for splice case. 3,935,373, Cl. 174-77.00R.

Smith, Christopher John, to Dow Corning Limited. Method of bonding silicone rubber to a primed surface. 3,935,348, Cl. 427-408.000.

Smith, Lloyd M.; and Webb, Robert E. Dial pulse detection method and apparatus. 3,935,392, Cl. 179-16.0EA.

Smith, Oliver W.; Carder, Charles H.; and Trecker, David J., to Union Carbide Corporation. Two-step coating process. 3,935,330, Cl. 427-41.000.

Smith, Paul E., Jr.; and Chilcott, Lloyd D. Heating system with fuel saving draft retarder. 3,934,796, Cl. 236-16.000.

Smith, Peter William: *See*—
Chinnock, Edwin Leroy; Gloge, Detlef Christoph; and Smith, Peter William, 3,934,773.

Smith, Randel P., to Singer Company, The. Machine and method for producing dense pile fabric. 3,934,524, Cl. 112-79.00A.

Smith-Schreyer & Assoc., Inc.: *See*—
Smith, Bert A.; and Getz, Paul C., 3,935,373.

Smith, Stanley, to Rolls-Royce (1971) Limited. Fire seal. 3,934,889, Cl. 277-226.000.

Smith, Theodore Dennis, to RCA Corporation. Ultrasonic wave transmitter mechanism. 3,934,544, Cl. 116-137.00A.

Smith, Thurman Dale: *See*—
Clark, Jack Phillip; Smith, Thurman Dale; and Foster, Alan Carl, 3,934,457.

Smith, Vernon J.: *See*—
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Snam Progetti S.p.A.: *See*—
Lugli, Gabriele; Mazzei, Alessandro; and Brandi, Gabriella, 3,935,175.

Snopko, Paul Adam, to Zenith Radio Corporation. Multiple-channel information translation system and method. 3,935,566, Cl. 340-173.0LM.

Snyder, Alan Kent; Schmidt, Arthur D.; Foote, Seldon T., deceased; and by Clipp, Robert R., executor, to Chicago Display Company. Article transfer apparatus. 3,934,702, Cl. 198-20.000.

Snyder, Clyde A.: *See*—
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Snyder, Stephen L. Riser release buckle device. 3,934,848, Cl. 244-151.00A.

Sobel, Sol: *See*—
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Sochrin, Gary R.: *See*—
Branecky, George N.; and Sochrin, Gary R., 3,935,429.

Societa'Italiana Resine S.I.R. S.p.A.: *See*—
Cocuzza, Gioacchino; Calcagno, Benedetto; and Torreggiani, Gianni, 3,935,279.

Societe Anonyme des Ateliers de Secheron: *See*—
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Societe Anonyme dite: Cartier: *See*—
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Societe Anonyme dite: L'Oreal: *See*—
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Societe Anonyme: Poclain: *See*—
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Societe de la Viscose Suisse: *See*—
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Societe Franco-Hispano-Americaine (Francispam): *See*—
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Societe Industrielle de Brevets et d'Etudes: *See*—
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Societe Legris France S.A.: *See*—
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
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Socknick, Rudi: *See*—
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Sodeyama, Hitoshi: *See*—
Murano, Minoru; Yanabu, Satoru; and Sodeyama, Hitoshi, 3,935,406.

Solidum, Hamilton M.; and Zobbi, Robert G., to American Chemical & Refining Company, Incorporated. Composition and method for stripping gold and silver. 3,935,005, Cl. 75-105.000.

Solie, James C., to Owatonna Tool Company. Three-way control valve. 3,934,610, Cl. 137-596.120.

Solomon, Richard A.: *See*—
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Solvay & Cie: *See*—
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Sondergaard, Jorgen: *See*—
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Sontel Inc.: *See*—
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Sony Corporation: *See*—
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Suzuki, Tadao, 3,935,513.

Sorensen, Karl-Otto; and Sondergaard, Jorgen, to Kanamark International Limited. Method for rendering wood resistant to fire. 3,935,341, Cl. 427-317.000.

Sorgenti, Harold A.: *See—*
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Sotirovic, Toma: *See—*
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Southwestern Industries, Inc.: *See—*
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Sparks, Allen K.: *See—*
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Speakman, Edwin L., to Standard Brands Incorporated. Process for depolymerizing amylaceous polymers. 3,935,187, Cl. 260-233.30R.

Spector, George: *See—*
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Spectrotherm Corporation: *See—*
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Spence-Bate, Harry A. H. Apparatus for making microfiches. 3,935,583, Cl. 354-292.000.

Sperandio, Francis, to SAFT-Societe des Accumulateurs Fixes et de Traction. Valve means for an electrochemical storage cell or the like. 3,935,030, Cl. 136-170.000.

Sperry Rand Corporation: *See—*
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Spinner, Frederick W.: *See—*
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Spirk, Franz; and Leistner, Werner, to Siemens Aktiengesellschaft. Method of operating a fluid-cooled hydropower generator. 3,935,488, Cl. 310-53.000.

Spirk, Franz, to Siemens Aktiengesellschaft. Supporting arrangement for the rotor of a vertical electric machine such as hydraulic generator or the like. 3,935,490, Cl. 310-91.000.

Spiteri, Joseph. Fluorescent lamp dimmer. 3,935,505, Cl. 315-194.000.

Spivack, John D.; and Klemchuk, Peter P., to Ciba-Geigy Corporation. Light stabilized polymer compositions. 3,935,163, Cl. 260-45.75N.

Spivack, John d.; and Klemchuk, Peter P., to Ciba-Geigy Corporation. Light stabilized polymer compositions. 3,935,164, Cl. 260-45.75N.

Springer, Willard J.: *See—*
Baker, Jr.; Bruce A.; and Springer, Willard J., 3,935,085.

Spurgeon, A. Dale, to Eli Lilly and Company. Apparatus and method for aligning x-ray diffraction camera. 3,935,450, Cl. 250-273.000.

Square D Company: *See—*
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Sracic, Albert Martin: *See—*
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Stacy, Denzil W.: *See—*
Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 3,935,032.

Stadlbauer, Wilhelm; Kump, Walter; and Koller, Erwin, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method and apparatus for handling bags. 3,934,388, Cl. 53-29.000.

Stahlecker, Fritz; and Stahlecker, Hans. Spinning unit operating in accordance with the open-end method. 3,934,396, Cl. 57-58.890.

Stahlecker, Hans: *See—*
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Stamco Division, The Monarch Machine Tool Company: *See—*
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Stamicarbon B.V.: *See—*
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Stand, Mille; and Davis, Stephen U., to Sealectro Corporation. Plasma gun including external adjustable powder feed conduit and infrared radiation reflector. 3,935,418, Cl. 219-121.00P.

Standard Brands Incorporated: *See—*
Speakman, Edwin L., 3,935,187.

Standard Havens, Inc.: *See—*
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Standard Oil Company: *See—*
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Feinstein, Allen; and Fields, Ellis K., 3,935,265.
Puskas, Imre; and Cengel, John A., 3,935,249.
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Stanley-Mabo: *See—*
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Stanley Works, The: *See—*
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Stapley, Edward O.: *See—*
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Starkey, Donald L.: *See—*
Schmitt, Joseph W.; and Starkey, Donald L., 3,935,437.

Starp, Franz W. R. Interchangeable lens adaptable to a camera or photographic shutter, with built-in sector system. 3,935,581, Cl. 354-270.000.

Stauch, Philipp: *See—*
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Stauffer Chemical Company: *See—*
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Kraft, Paul; and Altscher, Siegfried, 3,935,149.

Steiman, Wolf, to VCA Corporation. Hand-held dispenser pump construction. 3,934,763, Cl. 222-321.000.

Stein, Clinton L.; and Holien, Dennis D., to Esco, Inc. Sign frame. 3,934,365, Cl. 40-125.00G.

Steinke, John J., III: *See—*
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Steinke, Theodore D.; and Carter, Melvin A., to Kaiser Aluminum & Chemical Corporation. Process for melting metal. 3,935,003, Cl. 75-68.00R.

Stenback, Jan-Erik: *See—*
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Stengle, Edward J.; and Tillman, James J., to Owens-Illinois, Inc. Coated plastic substrates for coating compositions. 3,935,346, Cl. 427-385.000.

Stephan, Norbert: *See—*
Uhlmann, Otto; and Stephan, Norbert, 3,934,449.

Stephens, Richard G. Pattern recognition method and apparatus. 3,935,562, Cl. 340-146.3AG.

Stephenson, Earle W.; and Toews, Leonard E., to Kennametal Inc. Earthworking blade device. 3,934,654, Cl. 172-719.000.

Sterbal, Silvester, to Digital Components Corporation. Microminiature light source assemblage and mounting means therefor. 3,935,501, Cl. 313-499.000.

Sterling Drug Inc.: *See—*
Crounse, Nathan N., 3,935,195.
Jefferies, Patrick J.; and Crounse, Nathan N., 3,935,182.

Sterne, Jean Jacques: *See—*
Aron-Samuel, Jan Marcel Didier; and Sterne, Jean Jacques, 3,935,313.

Stevenson, Donald R.: *See—*
Vogl, Otto F.; and Stevenson, Donald R., 3,935,172.

Stewart-Warner Corporation: *See—*
Powell, Patrick L., 3,934,478.

Stichting Reactor Centrum Nederland: *See—*
Kanij, Johannes Bastiaan Willem; and Noothout, Arend Jaman, 3,935,120.

Stimson, Ian Leonard; and Dowell, Frederick Sidney, to Dunlop Limited. Carbon friction members having torque transmitting formations. 3,934,686, Cl. 188-251.00A.

Stoddart, Hugh F.: *See—*
de Luca, Peter C.; Stoddart, Hugh F.; and Jeffries, David, 3,935,462.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,935,220.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,935,223.

Stone Construction Equipment, Inc.: *See—*
Tertinek, Christian T., 3,934,377.

Straffon, Alan E.; and King, James C., to Electronic Machine Control (Sales) Limited; and Dexion-Comino International Limited. Transporter systems. 3,935,559, Cl. 340-32.000.

Strain, Robert Joseph; and Walden, Robert Henry, to Bell Telephone Laboratories, Incorporated. Analog inverter for use in charge transfer apparatus. 3,935,477, Cl. 307-214.000.

Strasser, Karl; and Hasenauer, Dieter, to Siemens Aktiengesellschaft. Fuel cell set and method. 3,935,028, Cl. 136-86.00C.

Stratoflex, Inc.: *See—*
Ide, Thomas N., III, 3,934,990.

Strella, Stephen: *See—*
Jelfo, Raymond L.; Strella, Stephen; and Hamilton, Willard C., 3,934,547.

Strickel, William R.: *See—*
Mesek, Frederick K.; Repke, Virginia L.; and Strickel, William R., 3,934,588.

Strini, Jean-Claude; and Costes, Jean-Raymond, to Rhone-Progil. Process for reducing the amount of trichloroethylene in 1,2-dichloroethane. 3,935,286, Cl. 260-652.00P.

Strobel, Erwin J., Jr., to Xerox Corporation. Sheet separating and feeding apparatus. 3,934,869, Cl. 271-35.000.

Strobel, Manfred: *See—*
Thiersch, Friedrich; Strobel, Manfred; and Schmitz, Theo, 3,935,078.

Strom, Sven B., to American Pulverizer Company. Scrap shredding system. 3,934,499, Cl. 100-53.000.

Stuckert, Paul E., to International Business Machines Corporation. Broad band directional signal generator. 3,935,480, Cl. 307-241.000.

Stumpf, Karl. System of construction components for the production of roller assemblies. 3,934,951, Cl. 308-20.000.

Suekane, Mikio; Hasegawa, Shiro; Tamura, Masaki; and Ishikawa, Yoshiyuki, to CPC International Inc. Production of sweet syrup from dextrose mother liquor. 3,935,070, Cl. 195-31.00F.

Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; and Shoji, Shoji, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of phosphoric acid. 3,935,298, Cl. 423-320.000.

Sugano, Takuo; and Mori, Yoshifumi, to Kentaro Hayashi. Method for providing dielectric isolation in an epitaxial layer of a compound semiconductor using the plasma oxidation. 3,935,328, Cl. 427-34.000.

Sugiura, Shotaro; Matsuura, Tetsuro; Ueno, Haruo; Kono, Minoru; Ishikawa, Hideo; and Tokutomi, Thunehiko, to UBE Industries, Ltd. Polybutadiene and process for producing same. 3,935,180, Cl. 260-94.20R.

Sugiyama, Masayoshi, to Hitachi, Ltd. Method of manufacturing semiconductor devices. 3,934,331, Cl. 29-583.000.

Sulkowski, Theodore S., to American Home Products Corporation. Imidazolinyl phenyl carbonyl compounds acid addition salts and related compounds. 3,935,218, Cl. 260-309.600.

Sullivan, John F. Foldable measuring stick. 3,934,351, Cl. 33-105.000.

Sulzberger, Kevin John. Milking system. 3,934,551, Cl. 119-14.040.

Sulzer Brothers Limited: *See—*
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Sumitomo Chemical Company, Ltd.: *See—*
Kudo, Ken-ichi; Ohmae, Tadayuki; and Uno, Akihiko, 3,935,282.
Yoshikawa, Kanji; Tatsukami, Yoshiharu; Shimba, Hiroshi; and Mukunashi, Hiroaki, 3,935,374.

Sumitomo Electric Industries, Ltd.: *See—*
Ichiba, Terumichi; Shimba, Hiroshi; and Mukunashi, Hiroaki, 3,935,375.
Yoshikawa, Kanji; Tatsukami, Yoshiharu; Shimba, Hiroshi; and Mukunashi, Hiroaki, 3,935,374.

Sumitomo Light Metal Industries, Ltd.: *See—*
Baba, Yoshio; and Kawai, Mituhiro, 3,935,007.
Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Hayashi, Yoshikatsu, 3,935,084.
Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Maeda, Toshinori, 3,935,349.

Sun Electric Corporation: *See—*
Geul, Herman Robert, 3,935,427.
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Sun Oil Company of Pennsylvania: *See—*
Young, Einar T.; Fromnick, Stephen M.; Mayer, Robert; and Livesay, Robert H., 3,934,756.

Sun Research and Development Co.: *See—*
Norton, Richard V., 3,935,238.

Sund, Joseph Tat-Hin; and Yamada, Yoshikazu, to Bell & Howell Company. Image control means and structured transfer sheet for thermal reproduction processes. 3,935,362, Cl. 428-207.000.

Sundstrand Corporation: *See—*
Gannaway, Edwin L., 3,934,967.

Sunstor Dentrificy Co. Ltd.: *See—*
Aimoto, Kenji; Hashimoto, Shigeru; and Yoneda, Toyoaki, 3,935,307.

Suntheimer, George; Howatt, John R.; and Consales, Emanuel J., to Patterson, Robert B.; Patterson, Mary D.; and Patterson, William A. Shampooing apparatus. 3,934,596, Cl. 132-9.000.

Susse, Wilhelm; and Alter, Heinz, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Strong field magnetic separators. 3,935,095, Cl. 209-222.000.

Suzue, Takashi: *See—*
Hashimoto, Sadao; Sakakibara, Ryuji; Kurashige, Yasushi; Takikawa, Katsuo; Osame, Yoko; Minami, Hiroshi; and Suzue, Takashi, 3,935,266.

Suzuki, Gyoji; and Tomotsu, Takeshi, to Fuji Photo Film Co., Ltd. Photosensitive etching composition. 3,935,117, Cl. 252-79.100.

Suzuki, Kunio: *See—*
Miyano, Tetsuji; Suzuki, Kunio; and Fukatsu, Hiroshi, 3,935,221.

Suzuki, Munenobu: *See—*
Umino, Tomio; Suzuki, Munenobu; and Shida, Tomohiko, 3,935,417.

Suzuki, Shigeyoshi: *See—*
Maruyama, Isamu; Suzuki, Shigeyoshi; and Yoshihiro, Yoshitake, 3,935,335.

Suzuki, Tadao, to Sony Corporation. Protective circuit for transistor amplifier. 3,935,513, Cl. 317-31.000.

Suzuki, Takashi: *See—*
Go, Tadahiro; Suzuki, Takashi; and Inoue, Masaaki, 3,935,140.

Suzuki, Toshio: *See—*
Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Hayashi, Yoshikatsu, 3,935,084.
Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Maeda, Toshinori, 3,935,349.

Swearingen, Judson S. Geothermal power system and method. 3,935,102, Cl. 210-83.000.

Sybron Corporation: *See—*
Rabinowitz, Azriel Jay, 3,934,929.

Symon, Ted: *See—*
Reichenbacher, Paul H.; Forsythe, Theresa M.; Sparks, Allen K.; and Symon, Ted, 3,935,234.

Symons, Philip Charles, to Energy Development Associates. Halogen hydrates. 3,935,024, Cl. 136-6.00E.

Syntex Corporation: *See—*
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Syntex (U.S.A.) Inc.: *See—*
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Jones, Gordon H.; Moffatt, John G.; and Edge, Michael D., 3,935,184.
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Synthelabo: *See—*
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Taber, Dudley A.: *See—*
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Taihei Company Ltd.: *See—*
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Taiho Pharmaceutical Company, Limited: *See—*
Hashimoto, Sadao; Sakakibara, Ryuji; Kurashige, Yasushi; Takikawa, Katsuo; Osame, Yoko; Minami, Hiroshi; and Suzue, Takashi, 3,935,266.

Takahashi, Akira: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; and Shoji, Shoji, 3,935,298.

Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, to Nissan Motor Company Limited. Constant velocity universal joint. 3,934,429, Cl. 64-21.000.

Takahashi, Kozo: *See—*
Murakami, Masuo; Takahashi, Kozo; Isaka, Ichiro; Ozasa, Teruaki; and Kashiwagi, Teruya, 3,935,198.

Takahashi, Sakae; Saeki, Shiro; and Onisawa, Yoshio, to Daicel Ltd. ABS resin composition. 3,935,143, Cl. 260-23.70R.

Takahashi, Sasuke. Swivel castors. 3,934,304, Cl. 16-34.000.

Takahashi, Tamotsu: *See—*
Kitano, Naohiko; Haseda, Katsumi; and Takahashi, Tamotsu, 3,934,358.

Takao, Hiroshi: *See—*
Togawa, Kinmochi; Matoba, Kazuo; Takao, Hiroshi; and Hata, Yoshitaka, 3,935,089.

Takata, Akihiko: *See—*
Arimoto, Kazuyuki; Maeda, Toshinobu; Hori, Fuzio; and Takata, Akihiko, 3,935,483.

Take, Teruo: *See—*
Abe, Jinnosuke; Watanabe, Tetsuo; Take, Teruo; Fujimoto, Kentaro; Fujii, Tadashiro; and Nishiie, Kazuyoshi, 3,935,193.

Taketomo, Sadao: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, 3,934,321.

Takikawa, Katsuo: *See—*
Hashimoto, Sadao; Sakakibara, Ryuji; Kurashige, Yasushi; Takikawa, Katsuo; Osame, Yoko; Minami, Hiroshi; and Suzue, Takashi, 3,935,266.

Tamag Basel AG: *See—*
Beringer, Monique; and Buchmann, Paul, 3,934,594.

Tamesui, Tuyoshi; and Matsuzaki, Tetsuo, to Toyoda Koki Kabushiki Kaisha. Apparatus for controlling the operation of a grinding wheel. 3,934,376, Cl. 51-165.910.

Tamura, Masaki: *See—*
Suekane, Mikio; Hasegawa, Shiro; Tamura, Masaki; and Ishikawa, Yoshiyuki, 3,935,070.

Tan, Aujit: *See—*
Hess, Johann T.; Debrunner, Kurt; and Tan, Aujit, 3,934,324.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Matuo, Yuhsi, 3,935,072.

Tanaka, Masaru; Matsumoto, Yoshimitsu; and Oku, Takeshi, to Matsushita Electric Industrial Co., Ltd. Compensation equipment for fluctuations in A.C. source voltage. 3,935,530, Cl. 323-19.000.

Tanaka, Tadashi; Oka, Joji; and Saito, Katushi, to Nippon Steel Corporation. Aqueous solution and method for surface treatment of metals. 3,935,035, Cl. 148-6.200.

Tancredi, Pier Luigi. Drain-flushing device. 3,934,280, Cl. 4-255.000.

Tannenberger, Helmut: *See—*
Cadman, Martyn A.; Voinov, Michel; and Tannenberger, Helmut, 3,935,025.

Tappan Company, The: *See—*
Perl, Richard L., 3,934,811.

Tarue, Osamu: *See—*
Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Shigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, 3,934,969.

Tashiro, Koji: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, 3,934,321.

Tatemichi, Hidemaro: *See—*
Ogasawara, Takahisa; Kobayashi, Yorimasa; Mizutani, Kiyokazu; Nakagawa, Teruo; Hisanaga, Noboru; and Tatemichi, Hidemaro, 3,935,173.

Tatsukami, Yoshiharu: *See—*
Yoshikawa, Kanji; Tatsukami, Yoshiharu; Shimba, Hiroshi; and Mukunashi, Hiroaki, 3,935,374.

Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Copying using pyroelectric film. 3,935,327, Cl. 427-19.000.

Taylor, John Thurston; Halliday, Anthony James; Angel, Jonathan George Cordy; and Blakemore, Bernard, to Colourvision Associates. Mechanisms for transporting strip material. 3,934,962, Cl. 352-194.000.

Taylor, Lynn J., to Owens-Illinois, Inc. Preparation of liquid crystal containing polymeric structure. 3,935,337, Cl. 427-180.000.

Taylor, Maurice J., to Westinghouse Electric Corporation. Heating means for high-voltage gas-type circuit interrupter. 3,935,408, Cl. 200-148.00B.

Teague, Walter Dorwin, Jr. Infrared space heater. 3,934,572, Cl. 126-92.00B.

Tec Group, Inc., The: *See—*
Richter, Harvey E., 3,935,156.

Technibiotics, Inc.: *See—*
Wolvek, Sidney; and Sobel, Sol, 3,934,592.

Technicolor, Inc.: *See—*
Rice, Harry E.; and Rude, John K., 3,935,434.

Technicon Instruments Corporation: *See—*
Beretsky, Irwin; and Lightenstein, Bernard, 3,934,458.
Wiseman, Donald F.; and Josephsen, Roy C., 3,934,965.

Tecza, Joseph: *See—*
Wolfinger, John F.; Quay, Robert; and Tecza, Joseph, 3,934,459.

Tee, Liong S.; Piazza, Carlo, deceased; and by Piazza, Judith B., executrix, to Standard Oil Company. New rotary valve. 3,934,937, Cl. 302-14.000.

Teijin Limited: *See—*
Aimoto, Kenji; Hashimoto, Shigeru; and Yoneda, Toyoaki, 3,935,307.
Kanai, Tamaki; Yamagishi, Takashi; Ohta, Tetsuya; and Moriyama, Hiroatsu, 3,935,166.

Teledyne Industries, Inc.: *See—*
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Teletype Corporation: *See—*
Glasson, Jerry Marshall; and Kabb, Harold Louis, 3,935,386.

Teller, Aaron J., to Teller Environmental Systems, Inc. Method of removing hydrogen sulfide from gases. 3,935,294, Cl. 423-226.000.

Teller Environmental Systems, Inc.: *See—*
Teller, Aaron J., 3,935,294.

Telsco Industries: *See—*
Phaup, Charles W., 3,934,820.

Tennis, Francis H., to Hydraulic Industries, Inc. Valve mechanism for automatic control of a number of fluid motors. 3,934,742, Cl. 214-762.000.

Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Hayachi, Yoshikatsu, to Sumitomo Light Metal Industries, Ltd. Anodizing process. 3,935,084, Cl. 204-58.000.

Terai, Shiro; Ichiryu, Akinari; Suzuki, Toshio; and Maeda, Toshinori, to Sumitomo Light Metal Industries, Ltd. Process of coating an aluminum article. 3,935,349, Cl. 427-409.000.

Terrell, Melvin L.; Lange, Paul F.; and Doolittle, James B., to International Telephone & Telegraph Corporation. Fluid control valve. 3,934,816, Cl. 251-141.000.

Terrell, N. James, Jr.: *See—*
Campillo, Anthony J.; Newnam, Brian E.; Shapiro, Stanley L.; and Terrell, N. James, Jr., 3,935,545.

Terry, Donald W.: *See—*
Thene, Donnie R.; O'Donoghue, Robert J.; and Terry, Donald W., 3,935,124.

Tertinek, Christian T., to Stone Construction Equipment, Inc. Concrete surface grinder. 3,934,377, Cl. 51-177.000.

Tessmann, Alfred H., to Industrial Research and Development Corporation. Method for interjoining stranded wire cable ends. 3,934,784, Cl. 228-125.000.

Texaco Inc.: *See—*
Howard, Curtis E.; and Calvin, Douglas G., 3,934,469.

Texas Instruments Incorporated: *See—*
Boulanger, Henry J.; and Brassard, Theodore, 3,935,511.
Buss, Dennis Darcy; and Bailey, Walter Howard, 3,935,439.
Hanni, Stephen L., 3,934,334.
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Oess, Frederick G.; and Peshock, Michael, Jr., 3,935,500.

Textron, Inc.: *See—*
Males, Robert E., 3,934,778.

Th. Goldschmidt AG: *See—*
Mitgau, Rotger; Petrik, Bruno; and Schedlitzki, Dietmar, 3,935,336.

Thayer, Richard L., to Wyo-Ben Products, Inc. Inorganic support for culture media. 3,935,067, Cl. 195-1.700.

Thene, Donnie R.; O'Donoghue, Robert J.; and Terry, Donald W., to Miller Chemical Corporation; and Mid-State Chemical & Supply Corporation, part interest to each. Anti-stick composition for coating and detackifying uncured rubber articles and the like. 3,935,124, Cl. 252-382.000.

Thermo-Industrie GmbH & Co. KG: *See—*
Rheinlander, Paul; and Voigt, Heinz, 3,934,755.

Thettu, Raghulinga R., to Xerox Corporation. Temperature sensing device. 3,934,477, Cl. 73-362.800.

Thibaut, Yves Albert Daniel, to U.S. Philips Corporation. Switching control for a reversing motor of a washing machine. 3,934,433, Cl. 68-12.00R.

Thiersch, Friedrich; Strobel, Manfred; and Schmitz, Theo, to Carl Still, Firma. Waste heat exhaust system for side burner regenerative coke oven batteries having a divided heating system. 3,935,078, Cl. 202-141.000.

Thomas, Kenneth H., to Webster Spring Co. Inc. Spring stacker. 3,934,736, Cl. 214-6.0FA.

Thompson-Hayward Chem. Co.: *See—*
Verbeeck, John F., 3,935,256.

Thompson, John W. Oyster breaker operated by electric motor having bearing seal device. 3,934,311, Cl. 17-74.000.

Thompson, Morice William: *See—*
Osmond, Desmond Wilfrid John; and Thompson, Morice William, 3,935,155.

Thompson, Terrence V., to Thompson, Terrence V.; Athans, George; and Athans, Leonidas. Truck air filter. 3,934,992, Cl. 55-324.000.

Thomson International Company: *See—*
Brassette, Donald J.; and Duncan, Richard A., 3,934,391.

Thor Power Tool Company: *See—*
Danielson, Irvin R., 3,934,657.

Thornburg, Daryl D.; and Christensen, James L., to General Dynamics Corporation. Method of and system for adaptive run length encoding of image representing digital information. 3,935,379, Cl. 178-6.000.

Thuillier, Germaine; and Laforest, Jacqueline, to CERPHA. Derivatives of 3-oxo-2,3-dihydro-1,4-benzoxazine. 3,935,203, Cl. 260-244.00R.

Thun, Niels, to Danfoss A/S. Multiplex circuit. 3,935,385, Cl. 178-50.000.

Tice, Joseph. Article combining live wall guide rail. 3,934,706, Cl. 198-32.000.

Tidd, Charles Edward, Jr.: *See—*
George, Emanuel John; Salter, Joseph Lane; Sauer, Earl Salvator; and Tidd, Charles Edward, Jr., 3,935,369.

Tiernan, Stanton W.; and Epple, Richard R., to Maryland Cup Corporation. Food dispensing valve means and control system for automatic container filling machines. 3,934,625, Cl. 141-115.000.

Tiesenhausen, Henry H.: *See—*
von Tiesenhausen, Henry H.; and Iverson, Carl K., 3,935,593.

Tillman, James J.: *See—*
Stengle, Edward J.; and Tillman, James J., 3,935,346.

Tilse, Wilhelm, to Timex Corporation. Fixation of double conducting hairspring. 3,934,403, Cl. 58-114.000.

Timbs, Norman E. Variable speed drive for bicycles and the like. 3,934,492, Cl. 74-740.000.

Timex Corporation: *See—*
Howard, Paul L., 3,935,026.
Tilse, Wilhelm, 3,934,403.

Tinkler, William: *See—*
Kiernan, Geoffrey Poulter; and Tinkler, William, 3,935,046.

Tischina, Inna Fedorovna: *See—*
Khromov, Gennady Lvovich; Davydov, Anatoly Borisovich; Maichuk, Jury Fedorovich; and Tischina, Inna Fedorovna, 3,935,303.

Titan Verpackungssysteme GmbH: *See—*
Kress, Heinz; and Heckmanns, Heinz, 3,934,918.

Toagosei Chemical Industrial Co. Ltd.: *See—*
Ogasawara, Takahisa; Kobayashi, Yorimasa; Mizutani, Kiyokazu; Nakagawa, Teruo; Hisanaga, Noboru; and Tatemichi, Hidemaro, 3,935,173.

Toews, Leonard E.: *See—*
Stephenson, Earle W.; and Toews, Leonard E., 3,934,654.

Togawa, Kinmochi; Matoba, Kazuo; Takao, Hiroshi; and Hata, Yoshitaka, to Nissan Motor Company Limited. Oxygen sensor coated with catalytic material. 3,935,089, Cl. 204-195.00S.

Tokutomi, Thunehiko: *See—*
Sugiura, Shotaro; Matsuura, Tetsuro; Ueno, Haruo; Kono, Minoru; Ishikawa, Hideo; and Tokutomi, Thunehiko, 3,935,180.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Beppu, Tatsuro; Iwamoto, Masami; and Sekiwa, Tetsuo, 3,935,039.
Murano, Minoru; Yanabu, Satoru; and Sodeyama, Hitoshi, 3,935,406.

Toland, William G., to Chevron Research Company. Supported turf or carpet-like material. 3,935,352, Cl. 428-95.000.

Toloczko, Henry A., to General Electric Company. Ice dispensing system of a refrigerator-freezer. 3,934,691, Cl. 193-32.000.

Tomaschko, Heinrich: *See—*
Senolt, Hans; Tomaschko, Heinrich; and Palvik, Georg, 3,935,093.

Tomioka, Yukio, to Hochiki Kabushiki Kaisha. Smoke detector adapted to a smoke sensing apparatus. 3,935,466, Cl. 250-385.000.

Tomomatsu, Hideo, to Quaker Oats Company, The. Method of manufacturing fungible polytetramethylene ether glycol. 3,935,252, Cl. 260-346.10R.

Tomotsu, Takeshi: *See—*
Suzuki, Gyoji; and Tomotsu, Takeshi, 3,935,117.

Tomozawa, Akihiro; Nakata, Kensuke; Kikuchi, Akira; and Agastuma, Takashi, to Hitachi, Ltd. Method of forming insulating film on interconnection layer. 3,935,083, Cl. 204-38.00A.

Tompkins, Edwin H.: *See—*
Kinney, Layton C.; and Tompkins, Edwin H., 3,934,503.

Tonon, Gianfranco: *See—*
Guillaneux, Pierre; Patou, Claude; and Tonon, Gianfranco, 3,935,504.

Tooley, Robert W., to Reliance Electric Company. Shaft bearing and method of assembling the same. 3,934,953, Cl. 308-72.000.

Toray Industries, Inc.: *See—*
Morita, Ken-ichi; Kinoshita, Yoshiro; and Kashio, Shigetora, 3,935,301.

Torin Corporation: *See—*
Lampietti, Bernard, 3,934,445.
Lesko, Richard; and Reynolds, David, 3,935,413.

Torreggiani, Gianni: *See—*
Cocuzza, Gioacchino; Calcagno, Benedetto; and Torreggiani, Gianni, 3,935,279.

Tortorello, Albert, to Raymond Lee Organization, Inc., The, a part interest. Drinking glass cleaner. 3,934,300, Cl. 15-244.00R.

Tosa, Tetsuya: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Matuo, Yuhsi, 3,935,072.
Tosan, Roland Jean Dominique: *See—*
Arsac, Aime Joseph; and Tosan, Roland Jean Dominique, 3,934,974.
Tosches, Anthony J., to Rockwell International Corporation. Carrier for shuttleless looms. 3,934,621, Cl. 139-122.00N.
Toth Aluminum Corporation: *See—*
Lippman, Alfred; Toth, Charles; and Sebenik, Roger Frank, 3,935,297.
Toth, Charles: *See—*
Lippman, Alfred; Toth, Charles; and Sebenik, Roger Frank, 3,935,297.
Toth, William E.: *See—*
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Trout, Robert G., to Owens-Corning Fiberglas Corporation. Method of and apparatus for making continuous strand mat. 3,934,312, Cl. 19-66.00T.
Trunzo, Floyd F., to Westinghouse Electric Corporation. Method of making electrical coils having improved strength and oil permeability. 3,934,332, Cl. 29-605.000.
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Tsiferov, Mikhail Ivanovich. Apparatus for drilling holes in earth surface. 3,934,659, Cl. 175-14.000.
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Van den Bogaert, Jan, to AGFA-GEVAERT N.V. Method and apparatus for producing electrostatic charge patterns. 3,935,455, Cl. 250-315.000.
Van der Meer, Richard H.; and Gabrielson, Dan A., to Ball Corporation. Method and apparatus for palletizing articles. 3,934,713, Cl. 198-34.000.
van Leuwen, Bruce G.; and Colafati, Ralph A., III, to Olin Corporation. High resilience polyurethane foam stabilized with a silicate-based surfactant composition. 3,935,133, Cl. 260-2.5AH.
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Weiss, Verne E.; Campbell, Glenn M.; and Wilson, Gerald L., to General Mills, Inc. Chip separating from a fried ribbon. 3,935,322, Cl. 426-439.000.
Weissberger, David; and Kalichmann, Isidore. Mechanized electrically heated windshield cleaner. 3,935,425, Cl. 219-228.000.
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Westmoreland, Robert W., Sr., to Fred Whitaker Company. High speed knitting machine and methods. 3,934,431, Cl. 66-57.000.
Wheelabrator-Frye, Inc.: *See—*
Diehn, Philip H.; and Bergh, John C., 3,934,372.
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Leliaert, Raymond M., 3,934,374.
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Whistle, Bobby A., 3,934,655.
White, Davis L., to Monadnock Lifetime Products, Inc. Police defensive implement. 3,934,877, Cl. 273-84.000.
White, Percy William; and Batley, Frank William. Flow monitoring system. 3,934,471, Cl. 73-194.00E.
Whitinger, Robert G., to Methodist Hospital of Indiana Inc. Holding and monitoring apparatus for intravenous infusion container. 3,934,474, Cl. 73-296.000.
Whitney, James C., to Dictaphone Corporation. Dual speed tape drive system for an endless loop dictating and transcribing system. 3,934,774, Cl. 226-50.000.
Whittaker, Richard E. Golf guide. 3,934,882, Cl. 273-183.00A.
Whysall, William Arthur, to Newey Goodman Limited. Buttons. 3,934,314, Cl. 24-113.00R.
Wiegand, Karl E., to Ethyl Corporation. Preparation of toluoyl-5-pyrryl-2-acetonitrile. 3,935,216, Cl. 260-326.50J.
Wilcox, Lyle: *See—*
Holschlag, Jerry B., deceased; and Wilcox, Lyle, 3,935,436.
Wilhelm Linnhoff OHG, Firma: *See—*
Kaluza, Eduard, 3,934,548.
Wilhelm, Max, to Ciba-Geigy Corporation. New amines and processes for their manufacture. 3,935,259, Cl. 260-553.00A.
Willem, Dieter: *See—*
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Williams, Gerald: *See—*
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, 3,934,972.
Williams, Robert M., to United States of America, Navy. Quiet shrouded circulation control propeller. 3,934,410, Cl. 60-269.000.
Willmark Products Company: *See—*
Auer, William F., 3,935,405.
Wilmers, Gottlieb, to Audi NSU Auto Union Aktiengesellschaft; and Wankel G.m.b.H. Throttling means for trochoidal rotary combustion engines. 3,934,558, Cl. 123-8.450.
Wilson, Alfred P., to Standard Oil Company. Smoke-retardant polyvinylchloride compositions. 3,935,142, Cl. 260-23.0XA.
Wilson, Gerald L.: *See—*
Weiss, Verne E.; Campbell, Glenn M.; and Wilson, Gerald L., 3,935,322.
Wilson, Melvin G.: *See—*
Hart, Gary A.; and Wilson, Melvin G., 3,935,540.
Wilson, Michael C.; and Schnick, Leslie E., to Pretty Products, Inc. Clothes bag and suspension hanger therefor. 3,934,631, Cl. 150-1.000.
Wilson, Robert E. Fender and splash guard. 3,934,900, Cl. 280-152.300.
Wilting, Hermanus Josephus Henricus: *See—*
Landheer, Frits; and Wilting, Hermanus Josephus Henricus, 3,935,586.
Wingard Limited: *See—*
Bottrill, John, 3,934,489.
Wingler, Frank; Pedain, Josef; Muller, Richard; Dhein, Rolf; and de Cleur, Eckhard, to Bayer Aktiengesellschaft. Pulverulent binders. 3,935,138, Cl. 260-17.00R.
Winkley, Michael W.: *See—*
Wendt, Gerhard R.; and Winkley, Michael W., 3,935,191.
Winterhalter, David R., to Sontel Inc. Telephone answering and message recording apparatus. 3,935,390, Cl. 179-6.00R.
Wisconsin Alumni Research Foundation: *See—*
Braton, Norman R.; and Acker, Jan R., 3,934,379.
Moran, Paul R.; Podgorsak, Ervin; Fullerton, Gary D.; and Fuller, Gene E., 3,935,457.
Wise, Donald L.; Schwope, Arthur D.; and Sell, Kenneth W., to United States of America, Navy. Wound covering and method of application. 3,935,308, Cl. 424-78.000.
Wiseman, Donald F.; and Josephsen, Roy C., to Technicon Instruments Corporation. Optical coupler. 3,934,965, Cl. 356-246.000.
Wisner, Ralph L.: *See—*
Burkholder, Nelson D.; Wisner, Ralph L.; and Taber, Dudley A., 3,935,363.
Witecki, Jacek, to Lawrence Peska Associates, Inc., a part interest. Device for cutting circles. 3,934,343, Cl. 30-310.000.
Wiva N.V.: *See—*
Needt, Jan Henrik, 3,934,747.

Wizemann, Leslie C.: *See—*
Shultz, Andrew; and Wizemann, Leslie C., 3,934,973.

Wolber, Jorg, to U.S. Philips Corporation. Correction circuit in television display apparatus using differential amplifiers. 3,935,507, Cl. 315-370.000.

Wolf, William: *See—*
Burr, John Kelsey; and Wolf, William, 3,934,946.

Wolfe, Denis G.; Tyler, Hugh J.; Jackson, Wilbur F., deceased; and by Benton, Linda A., trust administrator, to Robertshaw Controls Company. Thermal responsive device with an adsorbent carbonaceous material. 3,934,417, Cl. 60-516.000.

Wolfe, Merritt W., to Goodyear Tire & Rubber Company, The. Method of retreading a tire. 3,935,045, Cl. 156-96.000.

Wolfertz, Gunter: *See—*
Kramer, Friedhelm; and Wolfertz, Gunter, 3,934,777.

Wolfinger, John F.; Quay, Robert; and Tecza, Joseph, to General Electric Company. Torque monitoring system for rotating shaft. 3,934,459, Cl. 73-70.100.

Wolvek, Sidney; and Sobel, Sol, to Technibiotics, Inc. Suture bridge. 3,934,592, Cl. 128-335.000.

Wood, John R., to American Microsystems, Inc. Switch for electronic watch. 3,934,401, Cl. 58-23.00R.

Woodmansee, Donald E.: *See—*
Freeman, James M., Jr.; Gans, Bruce E.; Lambiris, Sotiris; and Woodmansee, Donald E., 3,934,553.

Worden, Raymond D. Transfer device. 3,934,733, Cl. 214-1.00Q.

Worstorff, Hermann Heinrich Karl, to Alfa-Laval AB. Method for machine milking of cows. 3,934,550, Cl. 119-14.020.

Wu, Yao Hua; and Lobeck, Walter G., to Mead Johnson & Company. Iminomethylindolines. 3,935,199, Cl. 260-243.00R.

Wu, You-Sun: *See—*
Rosenbaum, Fred J.; and Wu, You-Sun, 3,935,548.

Wuerker, Ralph F.: *See—*
Heflinger, Lee O.; Wuerker, Ralph F.; and Brooks, Robert E., 3,934,461.

Wurzel, Hugo: *See—*
Millheiser, Melvin; and Wurzel, Hugo, 3,934,315.

Wyeth, Nathaniel Convers; and Arnoth, Frank William, to Du Pont de Nemours, E. I., and Company. Process for preparing a hollow, rib-reinforced laminated structure. 3,935,358, Cl. 428-166.000.

Wyo-Ben Products, Inc.: *See—*
Thayer, Richard L., 3,935,067.

Xerox Corporation: *See—*
Davidson, James R., 3,934,549.
Donnelly, Thomas L.; and Mullen, Edward J., 3,935,424.
Jelfo, Raymond L.; Strella, Stephen; and Hamilton, Willard C., 3,934,547.
O'Brien, John F., 3,935,517.
Shuey, David R.; and Slomcenski, Robert J., 3,935,532.
Slomcenski, Robert J., 3,935,531.
Strobel, Erwin J., Jr., 3,934,869.
Thettu, Raghulinga R., 3,934,477.

Yagishita, Aisaburo. Filter. 3,935,107, Cl. 210-243.000.

Yale, Harry L., to E. R. Squibb & Sons, Inc. 2-Styryl-4H-pyrido(1,2-a)pyrimidin-4-ones. 3,935,197, Cl. 260-240.00D.

Yale, Harry Louis, to E. R. Squibb & Sons, Inc. α, α, α, α′, α′, α′-Hexafluorodi-m-tolylamine derivatives. 3,935,230, Cl. 260-268.00R.

Yamada, Haruyasu: *See—*
Kimura, Takeji; Oyama, Tomio; Yamada, Haruyasu; Harada, Shuzi; Yoshino, Hirokazu; and Tsuboka, Eiichi, 3,935,536.

Yamada, Michinobu: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, 3,934,321.

Yamada, Minoru: *See—*
Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, 3,935,015.
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Yamada, Yoshikazu: *See—*
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Kanai, Tamaki; Yamagishi, Takashi; Ohta, Tetsuya; and Moriyama, Hiroatsu, 3,935,166.

Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, to Lion Yushi Kabushiki Kaisha. Process for preparing plastic coated metal powders. 3,935,340, Cl. 427-216.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Isaka, Yoshiharu, 3,934,562.

Yamamura Glass Kabushiki Kaisha: *See—*
Matsumoto, Takao, 3,934,714.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Murakami, Masuo; Takahashi, Kozo; Isaka, Ichiro; Ozasa, Teruaki; and Kashiwagi, Teruya, 3,935,198.

Yamato, Akiko, Hiroshi Yamato, Yumi Yamato, heirs: *See—*
Kaneko, Hidehiko; Aritomi, Jiro; and Yamato, Yuzuru, deceased, 3,935,268.

Yamato, Yuzuru, deceased: *See—*
Kaneko, Hidehiko; Aritomi, Jiro; and Yamato, Yuzuru, deceased, 3,935,268.

Yamauchi, Teruo: *See—*
Fujieda, Mamoru; Yamauchi, Teruo; and Momono, Masakichi, 3,934,567.

Yanabu, Satoru: *See—*
Murano, Minoru; Yanabu, Satoru; and Sodeyama, Hitoshi, 3,935,406.

Yatsuk, Vladimir Grigorievich; and Petrenko, Vladimir Fedorovich. Method of eliminating self oscillations of an induction motor powered from a frequency changer and means for effecting same. 3,935,518, Cl. 318-227.000.

Yelland, Michael: *See—*
Baron, Thomas Douglas; Fishwick, Brian Ribbons; Leng, John Lindley; and Yelland, Michael, 3,935,183.

Yellowlees, John Mackinlay, to Belgonucleaire. Fuel assembly for gas-cooled nuclear reactors. 3,935,064, Cl. 176-73.000.

Yokohama Rubber Co., Ltd., The: *See—*
Koyama, Masao; Okada, Noboru; and Ogawa, Masahiro, 3,935,056.

Yokota, Yukio: *See—*
Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, 3,935,015.

Yoneda, Toyoaki: *See—*
Aimoto, Kenji; Hashimoto, Shigeru; and Yoneda, Toyoaki, 3,935,307.

Yoshida, Masafumi; Segawa, Masahiro; and Obara, Hiroshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Piezoelectric key board switch. 3,935,485, Cl. 310-8.500.

Yoshihiro, Yoshitake: *See—*
Maruyama, Isamu; Suzuki, Shigeyoshi; and Yoshihiro, Yoshitake, 3,935,335.

Yoshikawa, Kanji; Tatsukami, Yoshiharu; Shimba, Hiroshi; and Mukunashi, Hiroaki, to Sumitomo Electric Industries, Ltd.; and Sumitomo Chemical Company, Ltd. Laminated sheathed cable. 3,935,374, Cl. 174-102.00R.

Yoshino, Hirokazu: *See—*
Kimura, Takeji; Oyama, Tomio; Yamada, Haruyasu; Harada, Shuzi; Yoshino, Hirokazu; and Tsuboka, Eiichi, 3,935,536.

Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Nakanishi, Michio; and Yuki, Hiroshi, 3,935,217.

Young, Carter R.: *See—*
Amancharla, Amareswar; and Young, Carter R., 3,934,648.

Young, Einar T.; Fromnick, Stephen M.; Mayer, Robert; and Livesay, Robert H., to Sun Oil Company of Pennsylvania. Blending-type motor fuel dispensing apparatus. 3,934,756, Cl. 222-28.000.

Yuba Heat Transfer Corporation: *See—*
Butts, Oscar Wesley, 3,934,645.

Yuki, Hiroshi: *See—*
Nakanishi, Michio; and Yuki, Hiroshi, 3,935,217.

Zabotin, Alexandr Alexandrovich: *See—*
Loschilin, Evgeny Dmitrievich; Galperin, Alexandr Lvovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and Sakharov, Boris Alexandrovich, 3,934,619.

Zechnall, Richard; Linder, Ernst; Schmid, Albert; Raabe, Gotthold; Kerner, Karl; and Socknick, Rudi, to Robert Bosch G.m.b.H. Polarized light beam source in a vehicle headlight. 3,935,444, Cl. 240-9.500.

Zelaskowski, Catherine A., to Mobil Oil Corporation. Trace lead analysis method. 3,934,976, Cl. 23-230.00R.

Zeller, Josef K.: *See—*
Neumann, Friedhelm; and Zeller, Josef K., 3,934,640.

Zellner, Gertraud, administratrix: *See—*
Zellner, Hugo, deceased, 3,935,214.

Zellner, Hugo, deceased (by Zellner, Gertraud, administratrix), to Donau-Pharmazie Gesellschaft m.b.H. 2-or 3 keto-3-or-2-phenyl-1,4-disubstituted piperazines. 3,935,214, Cl. 260-268.0MK.

Zenith Radio Corporation: *See—*
Jirka, Howard F., 3,935,384.
Kinsch, Frank Joseph, 3,935,036.
Snopko, Paul Adam, 3,935,566.

Zilver, Edwin, to Intersilma B.V. Reel assembly for roller. 3,934,832, Cl. 242-54.00R.

Zimmer, Hildebrand, to Dragerwerk Aktiengesellschaft. Surgical instrument for sterilizing women by ligature of tubes. 3,934,589, Cl. 128-303.100.

Zimmermann, Manfred: *See—*
Lehnert, Gunther; Maertens, Dieter; and Zimmermann, Manfred, 3,935,178.

Zingaro, William P. Multiple cathode gas proportional detector. 3,935,464, Cl. 250-379.000.

Zinser Textilmaschinen GmbH: *See—*
Grau, Gerhard, 3,934,830.

Zlatkovskaya, Tatyana Nikolaevna: *See—*
Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,934,985.

Zobbi, Robert G.: *See—*
Solidum, Hamilton M.; and Zobbi, Robert G., 3,935,005.

Zuckschwert, Edgar; and Papst, Georg Friedrich, to Papst-Motoren KG. Tape drive. 3,934,841, Cl. 242-198.000.

Zumsteg, D. Bruce; Origlia, Gino; and Odom, J. T., to Standard Havens, Inc. Self-erecting surge storage system. 3,934,739, Cl. 214-501.000.

Zur, Henry Chanoch, to Arizona Lounger Company. Powered tilting lounger. 3,934,927, Cl. 297-69.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JANUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Berger, Julius, to Hoffmann-La Roche Inc. Antibiotic X-5108 for stimulating growth. Re. 28,700, Cl. 424-122.000.

Burroughs Corporation: *See*—
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, Re. 28,701.

Cessna Aircraft Company, The: *See*—
Freese, Evans Glenn, Re. 28,695.

Chappell, Peter Lee: *See*—
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, Re. 28,701.

Donald, John Henry: *See*—
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, Re. 28,701.

Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, to Burroughs Corporation. Dispensing system and security card for use therewith. Re. 28,701, Cl. 235-61.70B.

Freese, Evans Glenn, to Cessna Aircraft Company, The. Master cylinder construction affording automatic re-phasing of master and slave-cylinders. Re. 28,695, Cl. 60-546.000.

Hasegawa, Yo: *See*—
Murakami, Yoshinobu; Hasegawa, Yo; and Morimoto, Kazuhisa, Re. 28,698.

Hoffmann-La Roche Inc.: *See*—
Berger, Julius, Re. 28,700.

Kelling, Gordon L., to Possis Corporation. Hot melt machine. Re. 28,699, Cl. 222-56.

Macovski, Albert, to RCA Corporation. Noninteracting lens system for a color encoding camera. Re. 28,702, Cl. 358-47.000.

Markakis, Costas E.; and Vamvakoussis, George N. Fluidic clinometer control apparatus. Re. 28,694, Cl. 33-365.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Murakami, Yoshinobu; Hasegawa, Yo; and Morimoto, Kazuhisa, Re. 28,698.

Morimoto, Kazuhisa: *See*—
Murakami, Yoshinobu; Hasegawa, Yo; and Morimoto, Kazuhisa, Re. 28,698.

Murakami, Yoshinobu; Hasegawa, Yo; and Morimoto, Kazuhisa, to Matsushita Electric Industrial Co., Ltd. Electrophotographic material containing sensitizers. Re. 28,698, Cl. 96-1.600.

Newcombe, Sean Benjamin: *See*—
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, Re. 28,701.

Perkins, Leonard: *See*—
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, Re. 28,701.

Possis Corporation: *See* —
Kelling, Gordon L., Re. 28,699.

RCA Corporation: *See*—
Macovski, Albert, Re. 28,702.

Roe, Malcolm David: *See*—
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, Re. 28,701.

Rouverol, William S. Pitch point action gearing. Re. 28,696, Cl. 74-462.000.

Vamvakoussis, George N.: *See*—
Markakis, Costas E.; and Vamvakoussis, George N., Re. 28,694.

LIST OF PLANT PATENTEES

Moore, Ralph S. Miniature rose plant. 3,826, 1–27–76, Cl. 10.

Schammarello, Anthony M. Azalea plant. 3,827, 1–27–76, Cl. 56.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Richman, Stephen S. 238,617.

Acro-Fab Industries, Inc.: *See*—
Seakan, Raymond N. 238,548.

Addmaster Corp.: *See*—
Hauser, Stephen G. 238,582.

Airborne, S.A.: *See*—
Bernard Charles. 238,527.

Ajax Hardware Corp.: *See*—
Read, George D., McCain, and Scott. 238,530.

Aladdin Mfg. Co.: *See*—
Smith, Robert W., and Wintz. 238,586.

Allibert Exploitation Societe Anonyme: *See*—
Vrignaud, Guy. 238,531.

American Hospital Supply Corp.: *See*—
Vidal, Claude A. 238,576.

Ameritone Paint Corp.: *See*—
Dorr, Robert C. 238,620.

Andersson, Karl G., to Duni Bila AB. Bib. 238,521, 1–27–76, Cl. D2—229.

Anchor Hocking Corp.: *See*—
Benes, Frank J. 238,541.

Armstrong, William M., and W. D. Runswick, to Inlite Corp. Lighting fixture shade. 238,603, 1–27–76, Cl. D48—16.

Aupperle, Donald P., to Hewlett-Packard Co. Casing for a portable electronic multimeter. 238,560, 1–27–76, Cl. D10—46.

Aupperle, Donald P., to Hewlett-Packard Co. Casing for a portale electronic multimeter. 238,561, 1–27–76, Cl. D10—46.

Automatic Devices, Inc.: *See*—
Cameron, Robert E. 238,606.

Barad, Valerie, to Theodor Mfg. Corp. Combined vanity case and financial organizer. 238,619, 1–27–76, Cl. D86—10.

Barcolene Co., The: *See*—
Rivman, Samuel J. 238,551.

Benes, Frank J., to Anchor Hocking Corp. Receptacle or similar article. 238,541, 1–27–76, Cl. D7—6.

Benkoe, Erwin: *See*—
Goldfarb, Adolph E., Benkoe, and Merino. 238,595.

Berlin & Jones Co., Inc.: *See*—
Watson, Charles S. 238,574.

Bernard, Charles, to Airborne, S.A. Chair. 238,527, 1–27–76, Cl. D6—66.

Black and Decker Mfg. Co., The: *See*—
House, Lawrence E., II. 238,547.

Blank, Elliott E., to The Dow Chemical Co. Bottle or similar article. 238,555, 1–27–76, Cl. D9—143.

Borenstein, Norman S. Wrist support for use in bowling. 238,520, 1–27–76, Cl. D2—27.

Bressickello, Tony J. Display stand. 238,534, 1–27–76, Cl. D6—188.

Brindley, Robert E., to Union Carbide Corp. Flashlight. 238,-604, 1–27–76, Cl. D48—24.

Burger Box, Inc.: *See*—
Laigo, Edward M. 238,571.

Bush, Paul S. Support stand for a television receiver or similar article. 238,526, 1–27–76, Cl. D6—27.

Calibur Mfg. Co.: *See*—
Vota, John, and Storm. 238,570.

Cameron, Robert E., to Automatic Devices, Inc. Guard rail assembly for scaffolding. 238,606, 1–27–76, Cl. D54—1.

Carl Mfg. Co. Ltd.: *See*—
Mori, Chuzo. 238,575.

Charles Industries Corp.: *See*—
Goldman, Joseph. 238,573.

Cite Industries, Inc.: *See*—
Senter, Jonas. 238,524.

Cobia, Barnell L., to Green Island International, Inc. Potted plant receptacle. 238,601, 1–27–76, Cl. D35—3.

Crawford, Rachel B. Display holder. 238,528, 1–27–76, Cl. D6—85.

Cullinane, Daniel, Jr. Nozzle extractor. 238,546, 1–27–76, Cl. D8—29.

Daempa A/S: *See*—
Fischer, Jean A. 238,549.

Danfoss A/S: *See*—
Lehmann, Kjeld. 238,580.
Lehmann, Kjeld. 238,581.
Daniels, Fitz. Display rack for bottles or the like. 238,535, 1–27–76, Cl. D6—189.
Darwood, James R. Electronic telephone answering unit. 238,585, 1–27–76, Cl. D26—14.
Deere & Co.: *See*—
Saele, Arvid H., and Hutton. 238,602.
Degaetano, Ben. Electrical plug prong. 238,578, 1–27–76, Cl. D26—1.
DeShores, Robert E., and J. A. Mendez. Hooded aquarium unit. 238,591, 1–27–76, Cl. D30—11.
Di Marzo, Vincent. Cigarette dispenser. 238,588, 1–27–76, Cl. D27—46.
Dorr, Robert C., to Ameritone Paint Corp. Cosmetics matching mirror. 238,620, 1–27–76, Cl. D86—10.
Dow Chemical Co., The: *See*—
Blank, Elliott E. 238,555.
Dunl Bila AB: *See*—
Andersson, Karl G. B. 238,521.
Dunlap, Ray: *See*—
Jackson, Earl B., and Dunlap. 238,556.
Dyrup, Sven-Erik, to Trelleborgs Gummifabriks AB. Bumper element for mounting underneath belts or the like. 238,605, 1–27–76, Cl. D55—1.
Edwards, Bryant, to Illinois Tool Works, Inc. Beverage container or the like. 238,550, 1–27–76, Cl. D9—28.
Edwards, Bryant, to Illinois Tool Works, Inc. Beverage container or the like. 238,552, 1–27–76, Cl. D9—100.
Edwards, Bryant, to Illinois Tool Works, Inc. Beverage container or the like. 238,553, 1–27–76, Cl. D9—100.
Everitt, Delmar K.: *See*—
Goldfarb, Adolph E., Benkoe, Everitt, Chesley, and Friendich. 238,597.
Feldman, Drew. Wall mount hanging bracket. 238,533, 1–27–76, Cl. D6—137.
Field, Allen I., and S. P. Sock hanger. 238,539, 1–27–76, Cl. D6—251.
Field, Sidney P.: *See*—
Field, Allen I., and S. P. 238,539.
Fink, Morris, to Windsor Industries, Inc. Combined radio tissue dispenser and photo displayer. 238,612, 1–27–76, Cl. D56—4.
Fischer, Jean A., to Daempa A/S. Door-handles. 238,549, 1–27–76, Cl. D8—168.
Fletcher, Dawn R. Fur flower. 238,589, 1–27–76, Cl. D29—1.
Fukuda, Kiyoshi. Radio receiver. 238,611, 1–27–76, Cl. D56—4.
Gannon, Peter F., to Vinyl-Fab Industries. Safety ladder for an above the ground swimming pool. 238,607, 1–27–76, Cl. D54—1.
Gaylord Bros., Inc.: *See*—
Scherzer, Robert K. 238,536.
Goldfarb, Adolph E., and Erwin Benkoe: *See*—
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565 3,934,609
596.12 3,934,610
608 3,934,611
625.3 3,934,612
625.5 3,934,613

CLASS 138
44 3,934,614
111 3,934,615
113 3,934,616
114 3,934,617
3,934,618

CLASS 139
12 3,934,619
99 3,934,620
122N 3,934,621

CLASS 141
18 3,934,622
98 3,934,623
100 3,934,624
115 3,934,625
117 3,934,626
146 3,934,627

CLASS 144
2R 3,934,628
32 3,934,629
39 3,934,630

CLASS 148

1.5	3,935,033
6	3,935,034
6.16	3,935,036
6.2	3,935,035
38	3,935,037
110	3,935,038
171	3,935,039
175	3,935,040

CLASS 150

1	3,934,631

CLASS 152

210	3,934,632
221	3,934,633
354	3,934,634

CLASS 156

18	3,935,041
56	3,935,042
72	3,935,043
79	3,935,044
96	3,935,045
148	3,935,046
163	3,935,047
203	3,935,048
216	3,935,049
242	3,935,050
331	3,935,051
345	3,935,052
378	3,935,053
443	3,935,054
	3,935,055
507	3,935,056
578	3,935,057
602	3,935,058
620	3,935,059

CLASS 160

189	3,934,635
349R	3,934,636

CLASS 162

152	3,935,060
252	3,935,061

CLASS 164

56	3,934,637
89	3,934,638
100	3,934,639
281	3,934,640
283S	3,934,641

CLASS 165

23	3,934,642
32	3,934,643
51	3,934,644
67	3,934,645
105	3,934,646

CLASS 166

.5	3,934,647
116	3,934,648
254	3,934,649
267	3,934,650
282	3,934,651
285	3,934,652

CLASS 172

212	3,934,653
719	3,934,654

CLASS 173

46	3,934,655
124	3,934,656
169	3,934,657

CLASS 174

68.5	3,935,372
77R	3,935,373
102R	3,935,374
	3,935,375
138J	3,935,376
153R	3,935,377
158R	3,935,378

CLASS 175

7	3,934,658
14	3,934,659
102	3,934,660
211	3,934,661
405	3,934,662

CLASS 176

30	3,935,062
38	3,935,063
73	3,935,064

CLASS 177

137	3,934,663

CLASS 178

6	3,935,379
6.8	3,935,380
7.1	3,935,381
	3,935,382
7.2	3,935,383
7.5R	3,935,384
50	3,935,385
67	3,935,386
69.5TV	3,935,388
69.5G	3,935,387

CLASS 179

6E	3,935,389
6R	3,935,390
15A	3,935,391
16EA	3,935,392
18ES	3,935,394
18FA	3,935,393
84VF	3,935,395
99	3,935,396
111R	3,935,397
114A	3,935,398
115.5VC	3,935,399
	3,935,402
115.5R	3,935,400
170.2	3,935,403
182R	3,935,401

CLASS 180

9.44	3,934,664
9.62	3,934,665
11	3,934,666
14A	3,934,667
21	3,934,668
34	3,934,669
52	3,934,670
82C	3,934,671

CLASS 181

33HC	3,934,675
117	3,934,672
119	3,934,673
135	3,934,674

CLASS 182

182	3,934,676

CLASS 184

15R	3,934,677
103R	3,934,678

CLASS 187

1R	3,934,679
8.5	3,934,680
17	3,934,681
78	3,934,682

CLASS 188

32	3,934,683
71.9	3,934,684
181R	3,934,685
251A	3,934,686

CLASS 192

3.23	3,934,687
48.5	3,934,688
53C	3,934,689
84T	3,934,690

CLASS 193

32	3,934,691

CLASS 194

4C	3,934,692
4R	3,934,693
82	3,934,694

CLASS 195

1.7	3,935,065
	3,935,066
	3,935,067
31F	3,935,068
	3,935,069
	3,935,070
32	3,935,071
68	3,935,072
103.5R	3,935,073
	3,935,074
127	3,935,075

CLASS 196

14.52	3,935,076

CLASS 197

1R	3,934,695
17	3,934,696
72	3,934,697
90	3,934,698

CLASS 198

16	3,934,699
19	3,934,700
	3,934,701
20	3,934,702
22B	3,934,703
25	3,934,704
32	3,934,705
	3,934,706
34	3,934,707
	3,934,713
109	3,934,708
143	3,934,710
158	3,934,709
192R	3,934,711
195	3,934,712
244	3,934,714
252	3,934,716
282	3,934,717
287	3,934,718

CLASS 200

35R	3,935,404
52R	3,935,405
67G	3,935,411
144B	3,935,406
	3,935,407
148B	3,935,408
153G	3,935,409
332	3,935,410

CLASS 202

83	3,935,077
141	3,935,078

CLASS 204

28	3,935,080
30	3,935,081
32R	3,935,082
38A	3,935,083
58	3,935,084
180P	3,935,086
181	3,935,085
	3,935,087
	3,935,088
195S	3,935,089
234	3,935,092
243R	3,935,090
281	3,935,091

CLASS 206

45.14	3,934,719
223	3,934,715
326	3,934,720
364	3,934,721
365	3,934,722
422	3,934,723
507	3,934,724
519	3,934,725

CLASS 208

6	3,935,093

CLASS 209

8	3,935,094
222	3,935,095

CLASS 210

22	3,935,096
31C	3,935,097
38	3,935,098
43	3,935,099
45	3,935,100
47	3,935,101
83	3,935,102
97	3,935,103
	3,935,104
138	3,935,105
232	3,935,106
243	3,935,107
340	3,935,108
406	3,935,109
445	3,935,110
446	3,935,111
456	3,935,112
516	3,935,113

CLASS 211

7	3,934,727
128	3,934,728

CLASS 212

46A	3,934,729

CLASS 214

1BB	3,934,731
	3,934,732
1BH	3,934,730
1Q	3,934,733
6FA	3,934,736
6B	3,934,734
6D	3,934,735
16R	3,934,737
131A	3,934,726
145A	3,934,738
501	3,934,739
505	3,934,740
730	3,934,741
762	3,934,742

CLASS 215

1C	3,934,743
219	3,934,744
224	3,934,745
232	3,934,746

CLASS 219

10.49	3,935,412
10.55F	3,935,415
10.77	3,935,416
50	3,935,413
61	3,935,414
121EM	3,935,417
121LM	3,935,419
121P	3,935,418
125R	3,935,420
146	3,935,421
213	3,935,422
216	3,935,424
225	3,935,423
228	3,935,425

CLASS 220

5R	3,934,747
9R	3,934,748
63R	3,934,749
277	3,934,750
306	3,934,751
328	3,934,752

CLASS 221

93	3,934,753
213	3,934,754

CLASS 222

1	3,934,755
28	3,934,756
76	3,934,757
108	3,934,758
129.1	3,934,759
153	3,934,760
183	3,934,761
200	3,934,762
321	3,934,763
451	3,934,764

CLASS 223

70	3,934,765
73	3,934,766
106	3,934,767

CLASS 224

1R	3,934,768
5V	3,934,769
33	3,934,770
42.42A	3,934,771
45AA	3,934,772

CLASS 225

2	3,934,773

CLASS 226

50	3,934,774
196	3,934,775

CLASS 227

76	3,934,776
109	3,934,777
123	3,934,778
147	3,934,779

CLASS 228

2	3,934,780
37	3,934,781
51	3,934,782
110	3,934,783
125	3,934,784
135	3,934,785
138	3,934,786
184	3,934,787
212	3,934,788

CLASS 229

2.5	3,934,789
23R	3,934,790
37R	3,934,791

CLASS 233

7	3,934,792

CLASS 235

51	3,934,793
54A	3,934,794
54C	3,935,426
61.11A	3,935,431
61.11E	3,935,429
61.11R	3,935,428
61.12N	3,935,432
61.12R	3,935,430
61.7B	Re.28,701
61.7R	3,935,427
92CT	3,935,434
92C	3,935,433
151.34	3,935,435
151.35	3,935,436
152	3,935,437
174	3,935,438
181	3,935,439
184	3,935,440

CLASS 236

13	3,934,795
16	3,934,796
46	3,934,797

CLASS 237

55	3,934,798
67	3,934,799

CLASS 238

341	3,934,800

CLASS 239

2R	3,934,817
8	3,934,818
189	3,934,819
205	3,934,820
224	3,934,821
226	3,934,822
472	3,934,823
534	3,934,824

CLASS 240

1.3	3,935,442
6.4W	3,935,443
7.1R	3,935,445
9.5	3,935,444
102B	3,935,560

CLASS 241

16	3,934,825
81	3,934,826
84	3,934,827
102	3,934,828
259.1	3,934,829

CLASS 242

18DD	3,934,830
43	3,934,831
54R	3,934,832
56.9	3,934,833
67.1R	3,934,834
67.2	3,934,835
72.1	3,934,836
75.5	3,934,837
85.1	3,934,838
195	3,934,840
198	3,934,839
	3,934,841
199	3,934,842

CLASS 244

7C	3,934,843
40A	3,934,844
129D	3,934,845
130	3,934,846
137P	3,934,847
151A	3,934,848

CLASS 248

41	3,934,801
71	3,934,802
99	3,934,803
229	3,934,804
346	3,934,805
441	3,934,806
478	3,934,807

CLASS 249

27	3,934,808
117	3,934,809
	3,934,810

CLASS 250

211J	3,935,446
211R	3,935,441
233	3,935,447
236	3,935,448
252	3,935,449
273	3,935,450
283	3,935,451
	3,935,452
292	3,935,453
305	3,935,454
315	3,935,455
316	3,935,456
336	3,935,457
338	3,935,458
343	3,935,459
349	3,935,460
368	3,935,461
369	3,935,462
373	3,935,463
379	3,935,464
384	3,935,465
385	3,935,466
507	3,935,467
572	3,935,468

CLASS 251

11	3,934,811
45	3,934,812
62	3,934,813
80	3,934,814
129	3,934,815
141	3,934,816
163	3,934,849
171	3,934,850
248	3,934,851

CLASS 252

18	3,935,114
33.2	3,935,122
73	3,935,115
78	3,935,116
79.1	3,935,117
79.4	3,935,118
301.1R	3,935,120
301.4F	3,935,119
321	3,935,121
351	3,935,123
382	3,935,124
389A	3,935,125
415	3,935,244
437	3,935,126
465	3,935,127
467	3,935,128
525	3,935,129
542	3,935,130
555	3,935,131

CLASS 254

86R	3,934,852
131	3,934,853
134.3R	3,934,854
135R	3,934,855
184	3,934,856

CLASS 259

8	3,934,857
	3,934,858
	3,934,859
108	3,934,860

CLASS 260

2BP	Re.28,699
2.5AH	3,935,133
2.5BE	3,935,132
3.5	3,935,134
	3,935,135
4R	3,935,136
17R	3,935,137
	3,935,138
17.5	3,935,139
19UA	3,935,140
23XA	3,935,142
23H	3,935,141
23.7R	3,935,143
24	3,935,144
27BB	3,935,145
29.2TN	3,935,146
29.4R	3,935,147
29.6MN	3,935,150
29.6TA	3,935,149
29.6WB	3,935,151
29.6XA	3,935,148
30.4N	3,935,152
31.6	3,935,153
33.8SB	3,935,154
34.2	3,935,155
37PC	3,935,157
42.21	3,935,158
42.27	3,935,159
45.75N	3,935,163
	3,935,164
45.8NT	3,935,160
45.85B	3,935,165
45.9NC	3,935,161
	3,935,162
47C	3,935,166
49	3,935,167
75P	3,935,168
75R	3,935,170
75T	3,935,169
78P	3,935,171
78R	3,935,172
78.5E	3,935,173
80.7I	3,935,174
82.1	3,935,175
83.7	3,935,176
84.7	3,935,177
88.2D	3,935,178
93.1	3,935,179
94.2R	3,935,180
94.9H	3,935,181
155	3,935,182
162	3,935,183
211.5R	3,935,184
	3,935,185
233.3R	3,935,187
239B	3,935,190
	3,935,191
239.1	3,935,186
	3,935,189
	3,935,192
	3,935,193
239.55A	3,935,194
240CA	3,935,195
240D	3,935,197
240J	3,935,196
243C	3,935,198
	3,935,202
243R	3,935,199
	3,935,200
	3,935,201
244R	3,935,203
246B	3,935,205
247.1E	3,935,206
247.5R	3,935,207
249	3,935,208
250BN	3,935,209
250A	3,935,210
	3,935,211
256.4E	3,935,212
256.4Q	3,935,213
268EP	3,935,229
268MK	3,935,214
268R	3,935,230
270J	3,935,228
281S	3,935,227
282	3,935,226
294.8C	3,935,220
	3,935,224
295AM	3,935,221
295.5B	3,935,222
295.5R	3,935,223
307H	3,935,219
309.6	3,935,218
326.5J	3,935,216
326.5R	3,935,217
327C	3,935,215
330.5	3,935,231
332.2C	3,935,232
340.7	3,935,233
343.2R	3,935,234
	3,935,236
343.6	3,935,235
345.2	3,935,253
346.1R	3,935,252
346.2M	3,935,251
346.2R	3,935,250
346.8R	3,935,249
378	3,935,248
396R	3,935,246
	3,935,247
397.1	3,935,245
429K	3,935,242
463	3,935,243
468D	3,935,241
469	3,935,239
	3,935,240

475R 3,935,238
505E 3,935,237
514D 3,935,254
518R 3,935,255
534A 3,935,256
535P 3,935,257
553A 3,935,258
3,935,259
553B 3,935,260
557R 3,935,261
559R 3,935,262
3,935,263
561A 3,935,266
570R 3,935,268
570.7 3,935,267
580 3,935,264
584B 3,935,269
586P 3,935,270
594 3,935,271
597R 3,935,272
599 3,935,265
600R 3,935,273
602 3,935,274
603HF 3,935,275
609R 3,935,276
3,935,277
610R 3,935,278
615R 3,935,279
618H 3,935,280
619B 3,935,281
621H 3,935,282
621M 3,935,283
635C 3,935,284
638R 3,935,285
652P 3,935,286
652.5R 3,935,287
656R 3,935,288
660 3,935,289

CLASS 261

37 3,935,156
39B 3,935,290

CLASS 264

331 3,935,291
338 3,935,292

CLASS 266

23R 3,934,861
34T 3,934,862
35 3,934,863
36H 3,934,864

CLASS 267

114 3,934,865
161 3,934,866

CLASS 270

32 3,934,867

CLASS 271

9 3,934,868
35 3,934,869
164 3,934,870
184 3,934,871
188 3,934,872

CLASS 273

26E 3,934,873
35A 3,934,874
67A 3,934,875
73C 3,934,876
84 3,934,877
95A 3,934,878
104 3,934,879
108 3,934,880
110 3,934,881
183A 3,934,882

CLASS 274

9RA 3,934,884
9B 3,934,883
23R 3,934,885

CLASS 277

2 3,934,886
31 3,934,837
134 3,934,888
226 3,934,889

CLASS 279

16 3,934,890
61 3,934,891

CLASS 280

11.12 3,934,892
11.35K 3,934,893
47.19 3,934,894
47.26 3,934,895
87R 3,934,896
3,934,897
150B 3,934,898
152R 3,934,899
152.3 3,934,900
154.5R 3,934,901

CLASS 285

156 3,934,902
3,934,903
158 3,934,904
229 3,934,905
371 3,934,906

CLASS 290

52 3,935,469

CLASS 292

121 3,934,907
150 3,934,908
251.5 3,934,909
346 3,934,910

CLASS 293

68 3,934,911
73 3,934,912
99 3,934,913

CLASS 294

1CA 3,934,914
16 3,934,915
64R 3,934,916
70 3,934,917
74 3,934,918
3,934,919
87R 3,934,920

CLASS 295

1 3,934,921

CLASS 296

1S 3,934,922
3,934,923
23R 3,934,924
28A 3,934,925
35A 3,934,926

CLASS 297

69 3,934,927
71 3,934,928
75 3,934,929
291 3,934,930
319 3,934,931
320 3,934,932
384 3,934,933
3,934,934

CLASS 299

2 3,934,935

CLASS 301

38S 3,934,936

CLASS 302

14 3,934,937

CLASS 303

21A 3,934,939
21F 3,934,941
21R 3,934,940
52 3,934,942
218 3,934,938

CLASS 305

35EB 3,934,943
38 3,934,944

CLASS 307

32 3,935,471
88.3 3,935,472
105B 3,935,470
117 3,935,473
205 3,935,474
208 3,935,475
213 3,935,476
214 3,935,477
229 3,935,478
237 3,935,479
241 3,935,480
251 3,935,481
252B 3,935,482
295 3,935,483

CLASS 308

4A 3,934,945
6C 3,934,946
9 3,934,947
3,934,948
3,934,949
10 3,934,950
20 3,934,951
36.1 3,934,952
72 3,934,953
3,934,954
3,934,955
174 3,934,956
207A 3,934,957
238 3,934,958

CLASS 310

8.2 3,935,484
8.5 3,935,485
12 3,935,486
46 3,935,487
53 3,935,488
90 3,935,489
91 3,935,490

CLASS 313

25 3,935,491
54 3,935,492
96 3,935,493
190 3,935,494
220 3,935,495
402 3,935,496
405 3,935,497
413 3,935,499
417 3,935,498
495 3,935,500
499 3,935,501

CLASS 315

94 3,935,502
111.6 3,935,503
111.7 3,935,504
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	229	238,521		251	238,539		193	238,557	D19—	3	238,574	D30—	11	238,591			238,608
	237	238,522	D7—	6	238,541	D10—	15	238,558		76	238,575		13	238,592	D56—	4B	238,609
	272	238,523		18	238,542		34	238,559	D23—	4	238,576	D34—	5ST	238,593			238,610
	321	238,524		72	238,543		46	238,560		48	238,577		11R	238,594			238,611
	400	238,525		188	238,544			238,561	D26—	1A	238,578		15AF	238,596			238,612
D6—	27	238,526		206	238,545		78	238,562		R	238,579		AJ	238,595	D57—	1E	238,540
	66	238,527	D8—	29	238,546		109	238,563		5C	238,582		JJ	238,598	D61—	B	238,613
	85	238,528		30	238,547	D12—	10	238,564		R	238,580			238,599	D73—		238,614
	88	238,529		114	238,548		62	238,565			238,581			238,600	D83—	F	238,616
	97	238,530		168	238,549			238,566		13	238,583		KK	238,597		H	238,615
	99	238,531	D9—	28	238,550		65	238,567		14A	238,585	D35—	3A	238,601		12A	238,617
	113	238,532		43	238,551		153	238,568		K	238,584	D40—	5	238,602	D86—	10F	238,618
	137	238,533		100	238,552		169	238,569	D27—	13	238,586	D48—	16D	238,603		H	238,620
	188	238,534			238,553		172	238,570		15	238,587		24A	238,604		N	238,619
	189	238,535		116	238,554	D13—	1B	238,571		46	238,588	D54—	1	238,606	D87—	5C	238,621
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Design Patents

2 :	238,523		238,593		238,584	25 :	238,546	35 :	238,563		238,612
3 :	238,572		238,595		238,601		238,548	36 :	238,526	37 :	238,622
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Plant Patents

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Rogers C. B. Morton, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner